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ON THE BREEDING, REARING, FATTENING, AND GENERAL MANAGEMENT OF NEAT CATTLE.

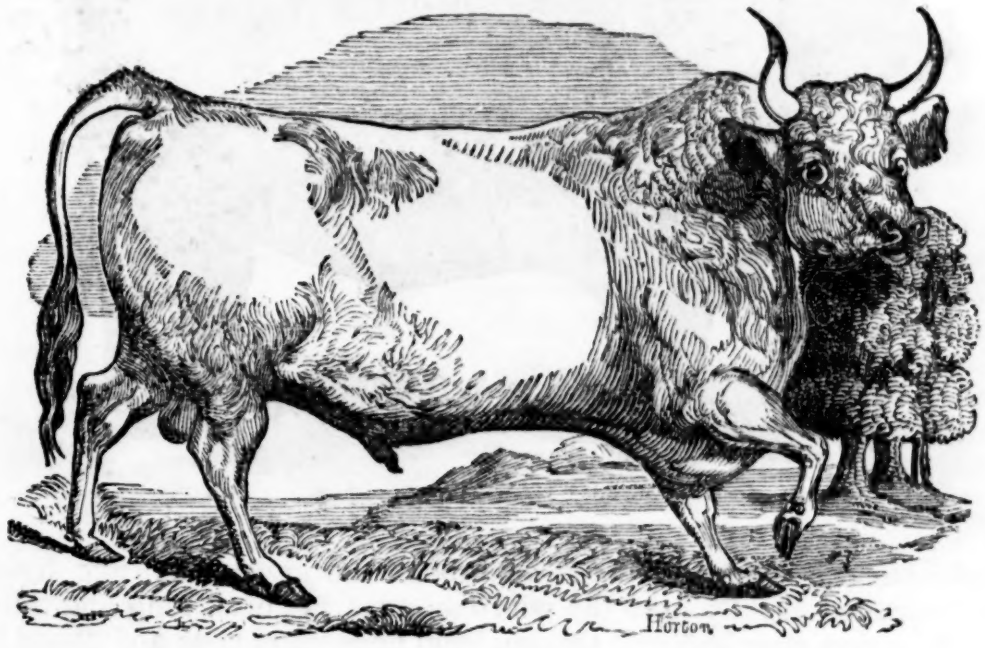
Extracts from the last edition (1833) of the "Complete Grazier."

Introductory view of the different breeds of neat cattle in Great Britain.

Of the various sources which compose the wealth of nations, there are few, perhaps, of greater moment, or which have a superior claim to attention, than that branch of rural economy which is the subject of the following pages. In fact, when it is considered, that not only the servants of a farmer, but also his cattle, are productive laborers; when we recollect the stimulus to industry, as well as the rapid circulation of capital which the farmer occasions, by furnishing constant employment to the numerous artificers who are occupied in manufacturing implements which are indispensably necessary to him; when we call to mind the immense mass of materials which his *productive* labor supplies for the purposes of commercial intercourse, and especially the influence produced by that labor on the comfort and appearance of towns, whose inhabitants must otherwise be destitute of the necessaries of life; when all these diversified circumstances are taken into consideration, every reflecting inquirer must acknowledge, that of all the ways in which a capital can be employed, this is by far the most advantageous to society.

Justly, therefore, has it been remarked, "that the capital employed in agriculture not only puts into motion a greater quantity of productive labor than any equal capital employed in manufactures, but, also in proportion to the quantity of productive labor which it employs, it adds a much greater value to the annual produce of the land and labor of the country, while it increases the real wealth and revenue of its inhabitants."*

Many circumstances have long occurred to render live stock an object of the utmost importance to the farmer; and notwithstanding the great advances made in other branches of husbandry, none has undergone a greater change of system, or has received more manifest improvement, than the breeding, rearing, and management of cattle. Independently of the stimulus afforded, during the late war, to the exertions of the mere grazier by the rapid increase in the price of all the necessaries of life, the influence of many societies established of late years for the encouragement of agriculture has powerfully tended to promote inquiry, and to disseminate information on this interesting subject; while the patronage and example of several public spirited noblemen, and gentlemen of high rank, have diffused a taste for the pursuits of rural economy, that has had a most beneficial effect on the general prosperity of the country. Among these, none have attracted more attention than those which are discussed in the following pages; and, although the main object is to convey instruction on the points more immediately applicable to the business of the grazier, it is yet presumed that a concise outline of the principal breeds, and varieties of breeds of cattle found in this highly cultivated island, cannot but prove acceptable to every class of farmer.



I. *The Wild Cattle*—Of a bull of which race, the above is a portrait,—were the original stock of the kingdom, before enclosures were known. They are said to be still found at Chartley Park, in Derbyshire, and, perhaps, in one or two more; but it is believed, that the only pure breed is that preserved, in a wild state, at Chillingham Castle, in Northumberland, the seat of the Earl of Tankerville, whose steward, Mr. Bailey, thus describes them:†

"Their color is invariably white; muzzle black; the whole of the inside of the ear, and about one-

*Smith's Wealth of Nations, Vol. II. p. 53, Fourth edition.

† Agricultural Survey of Northumberland, Third edition p. 141.

third of the outside, from the tip downwards, red; horns white, with black tips, very fine, and bent upwards.* Some of the bulls have a thin upright mane, about an inch and a half or two inches long: the weight of the oxen is from thirty-five to forty-five stone, of fourteen pounds; and that of the cows, from twenty-five to thirty-five stone the four quarters. The beef is finely marbled, and of excellent flavor.

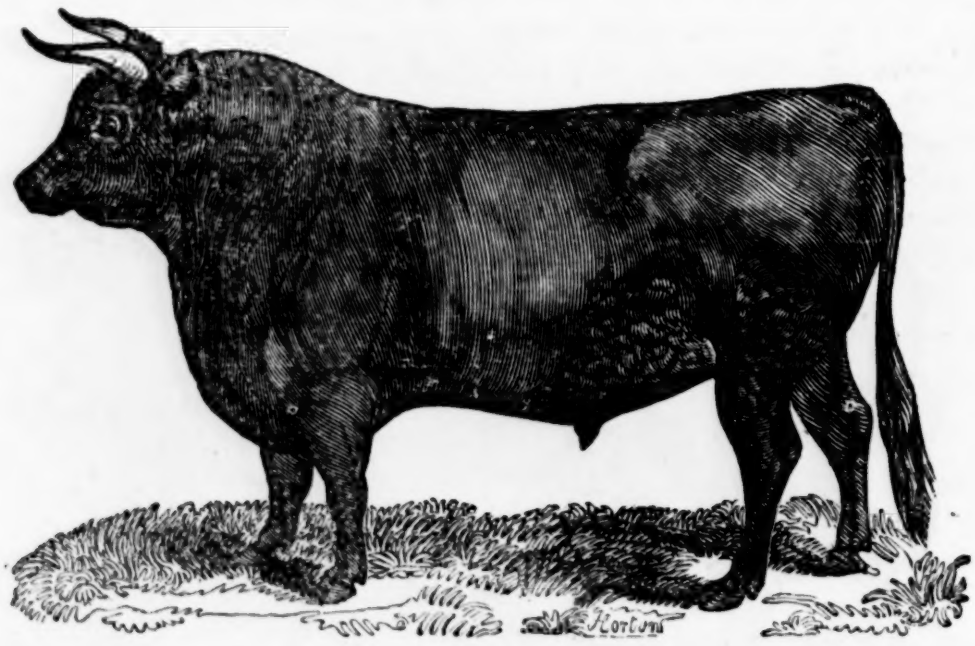
"From the nature of their pasture, and the frequent agitation they are put into, by the curiosity of strangers, it cannot be expected they should get very fat; yet the six years' old oxen are generally very good beef; from whence it may be fairly supposed that, in proper situations, they would feed well.

"At the first appearance of any person they set off at full speed, and gallop to a considerable distance; when they wheel round, and come boldly up again, tossing their heads in a menacing manner: on a sudden they make a full stop, at the distance of forty or fifty yards, looking wildly at the object of their surprise, but upon the least motion being made, they again turn round, and gallop off with equal speed; forming, however, a shorter circle, and returning with a bolder and more threatening aspect, they approach much nearer, when they make another stand, and again gallop off. This they do several times, shortening their distance, and advancing nearer till they come within a few yards, when most people think it prudent to leave them.

"The mode of killing them was, perhaps, the only modern remains of the grandeur of ancient hunting. On notice being given that a wild bull would be killed upon a certain day, the inhabitants of the neighborhood came in great numbers, both horse and foot; the horsemen rode off the bull from the rest of the herd until he stood at bay, when a marksman dismounted and shot. At some of these huntings, twenty or thirty shots have been fired before he was subdued: on such occasions, the bleeding victim grew desperately furious from the smarting of his wounds and the shouts of savage joy that were echoing on every side. From the number of accidents that happened, this dangerous mode has been seldom practised of late years; the park-keeper alone generally shooting them with a rifled gun at one shot.

"When the cows calve, they hide their calves for a week or ten days in some sequestered situation, and go and suckle them two or three times a day. If any person come near the calves, they clap their heads close to the ground, and lie like a hare in a form, to hide themselves. This is a proof of their native wildness, and is corroborated by the following circumstance, that happened to the writer of the narrative, who found a hidden calf, two days old, very lean, and very weak; on stroking its head, it got up, pawed two or three times like an old bull, bellowed very loud, retired a few steps, and bolted at his legs with all its force; it then began to paw again, bellowed, stepped back, and bolted as before; but knowing its intention, and stepping aside, it missed him, fell, and was so very weak that it could not rise, though it made several efforts; but it had done enough; the whole herd were alarmed, and, coming to its rescue, obliged him to retire; for the dams will allow no person to touch their calves without attacking them with impetuous ferocity.

"When any one happens to be wounded, or grown weak or feeble through age or sickness, the rest of the herd set upon it, and gore it to death."



II. *The Devonshire breed*, delineated above, is supposed to have descended directly from the wild race. It is found in its purest state in North Devon; in the agricultural report of which district its peculiar qualities are thus described by the late Mr. Vancouver:—

"Its head is small, clean, and free from flesh about the jaws; deer like, light and airy in its countenance; neck long and thin; throat free from jowl or dewlap; nose and round its eyes of a dark orange color; ears thin and pointed, tinged on their inside with the same color that is always found to encircle its eyes; horns thin, and fine to their roots, of a cream color, tipped with black,* growing with

* There is, however, a breed of the same cattle, in Yorkshire, which is said to be hornless. See the Introduction to the work entitled "British Husbandry," in the Farmer's Series of the Library of Useful Knowledge.

* The late Arthur Young, formerly secretary to the Board of Agriculture, describes thorough bred Devons as of a bright red, neck and head small, eye prominent and round it a ring of bright yellow; the nose round, the nostril having the same color; the horn clear and

a regular curve upwards, and rather springing from each other; light in the withers, resting on a shoulder a little retiring and spreading, and so rounded below as to sink all appearance of its pinion in the body of the animal; open bosom, with a deep chest, or keel; small and tapering below the knee, fine at and above the joint, and where the arm begins to increase, it becomes suddenly lost in the shoulder; line of the back straight from the withers to the rump, lying completely on a level with the pin, or huckles, which lie wide and open; the hind quarters seated high with flesh, leaving a fine hair ham tapering from the hock to the fetlock; long from rump to huckle, and from the pinion of the shoulder to the end of the nose; thin loose skin, covered with hair of a soft and furry nature, inclined to curl whenever the animal is in good condition and in full coat, when it also becomes mottled with darker shades of its permanent color, which is that of a bright blood red, without white, or other spots, particularly on the male; a white udder is sometimes passed over, but seldom without objection.

"This description may be considered as a summary of the perfections as to the exterior appearance of the animal: what, under the same head, may be regarded as defects, appear first in the sudden retiring of the vamp from behind the huckle to a narrow point backwards; the great space between the huckle and first rib; the smallness of the angle inwards at which the ribs appear to be projected from the spine or back-bone, often giving the appearance of a flat-sided animal, and in its being so much tucked up in the girth as to show an awkward cavity between the keel and navel, the line of which, it is presumed, should always be found to hold a position as nearly as possible parallel with that of the back from the withers to the loin. The animal is, however, generally well grown, and filled up behind the shoulder."

The North Devon cattle are highly esteemed both for feeding and draught; but are not so much valued for the dairy. For all the purposes of labor, whether activity, docility, or strength and hardiness, this breed can scarcely be excelled; and it is even said that, on fallow land, it is no uncommon day's work for four steers to plough two acres with a double furrow plough. The ordinary average weight of the oxen, when fatted at five years old, is about eleven score per quarter; and that of full sized cows seldom exceeds eight.

In South Devon there is a mixture of the pure North Devon stock with a larger breed, of the same kind, called the *Old Marlborough Red;* which is said to have descended from the South Molton stock, although at present they differ materially from them in size, and in having a dingy brown or blackish color at the ears, nose, and round the eyes, or wherever the orange tint is observable in the genuine race. A cross with this species is, however, found to fatten more readily than the pure South Devon, and is therefore generally preferred.

III. The *Sussex breed* differs but little from the Devonshire: when pure, the cattle are invariably dark red; and those which are marked with a mixture of either white or black, although passing under the denomination of Sussex, are always crossed with foreign blood. In other respects they are thus described by an eminent breeder,* the accuracy of whose judgement has been confirmed by many intelligent graziers.

"A thin head, and clean jaw; the horns pointing forward a little, and then turning upward, thin, tapering, and long; the eye large and full; the throat clean, no dewlap; long and thin in the neck; wide and deep in the shoulders; no projection in the point of the shoulder, when looked at from behind; the fore-legs wide; round and straight in the barrel, and free from a rising back-bone; no hanging heaviness in the belly; wide across the loin; the space between the hip-bone and the first rib very small; the hip-bone not to rise high, but to be large and wide; the loin, and space between the hips, to be flat and wide, but the fore part of the carcass round; long and straight in the rump, and wide in the tip; the tail to lay low, for the flesh to swell above it; the legs not too long; neither thick nor thin on the thigh; the leg thin; shut well in the twist; no fulness in the outside of the thigh, but all of it within; a squareness behind, common in all long-horned beasts, greatly objected to; the finer and thinner in the tail the better.

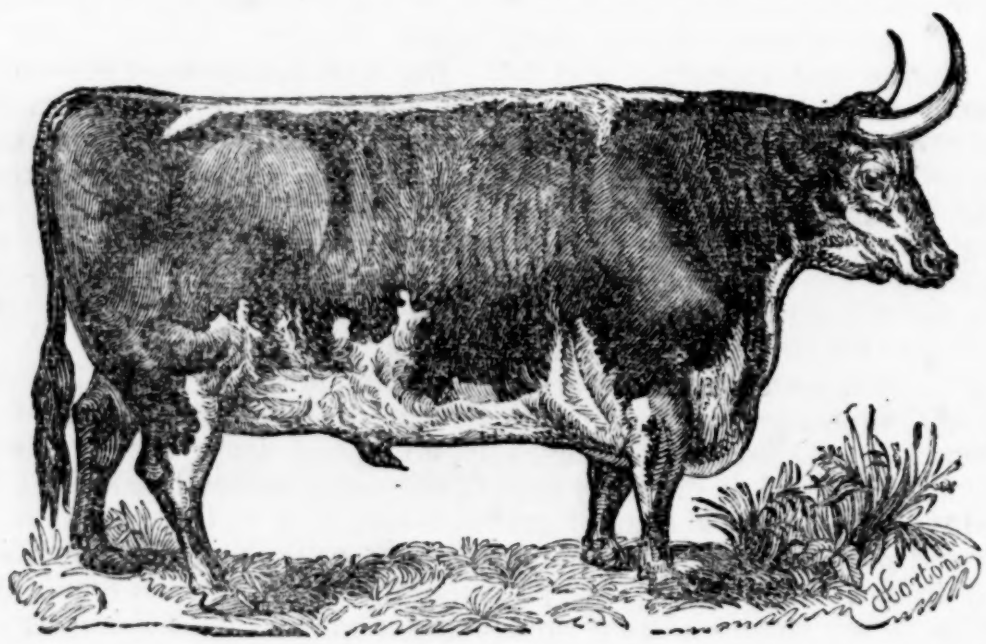
"Of these points, the Sussex beasts are apt to be more deficient in the shoulder than in any other part. A well made ox stands straight, and nearly perpendicular, on small clean legs; a large bony leg is a very bad point, but the legs moving freely, rather under the body than as if attached to the sides; the horns pushing a little forward, spreading moderately, and turning up once. The horn of the Devonshire, which very much resembles the Sussex, but smaller and lighter, is longer, and rises generally higher. The straightness of the back line is sometimes broken, in very fine beasts, by a lump between the hips."

On a comparison between the Devon and Sussex breeds, the former has been considered by competent judges as thinner, narrower, and sharper than the latter, on the top of the shoulder or blade bone; the point of the shoulder generally projects more, and they usually stand narrower in the chest; their chine is thinner, and flatter in the barrel, and they hang more in the flank; but they are wider in the hips, and cleaner in the neck, head, and horns, and smaller in the bone, than the Sussex; their hides are thinner and softer, and they handle as mellow. The distinction between them, however, is not very striking; they are equally profitable to the grazier, and, as working cattle, they both stand unrivalled.†

transparent, upright, tapering, and gently curved, but not tipped with black.—*See Agricultural Survey of Sussex, p.* 248.

* Mr. Ellman, of Glynde. See Agricultural Survey of Sussex, p. 231.

† See the Agricultural Survey of Sussex, p. 238 and Chapter II.



IV. The *Hereford breed* is a variety of the Devon and Sussex, but is larger and weightier than either; being generally wider and fuller over the shoulders or chine, and the breast, or brisket, as well as the after part of the rump. The prevailing color a reddish brown, with white faces; the hair fine, and the skin thin.

In the true bred Hereford cattle there is no projecting bone in the point of the shoulder, which in some breeds forms almost a shelf, against which the collar rests, but on the contrary tapers off; they have a great breadth before, and are equally weighty in their hind quarters; the tail not set on high; a great distance from the point of the rump to the hip bone; the twist full, broad, and soft; the thigh of the fore legs to the pastern joint tapering and full, not thin, but thin below the joint; the horn pushes aside a little, and then turns up thin and tapering; remarkably well feeling; mellow on the rump, ribs, and hip bone. The quality of the meat not hard, but fine as well as fat; little coarse flesh about them, the offal and bone being small in proportion to their weight; whilst their disposition to fatten is equal, or nearly so, to that of any other breed in the island. They are, however, ill calculated for the dairy; their constitutional disposition to accumulate flesh being in opposition to the qualities of good milking cows,—an observation which will equally apply to every breed, when similarly constituted. A breed of cattle equally adapted to the shambles, the dairy, and the plough, is indeed not to be met with, and experience teaches that these properties are inconsistent with each other. The Hereford cattle are by many good judges considered to approach the nearest to that perfect state of any of the large breeds: they arrive early at maturity, and are fit for labor; but it is as fatting stock that they excel, and it is a different variety of the same breed that is preferred for the dairy. There is, indeed, a more extraordinary disproportion between the weight of Herefordshire cows, and that of the oxen bred from them, than is to be found in any other of the superior breeds: they are comparatively small, extremely delicate, and light fleshed; and it is said that they are not unfrequently the mothers of oxen nearly three times their own weight.*

On comparison with the Devon and Sussex, the Hereford breed will probably not be found equally active and hardy in the yoke; but it is generally considered to exceed them in the quality of fattening;† and when compared with any one breed, it may fairly rank at least among the very best in the United Kingdom.

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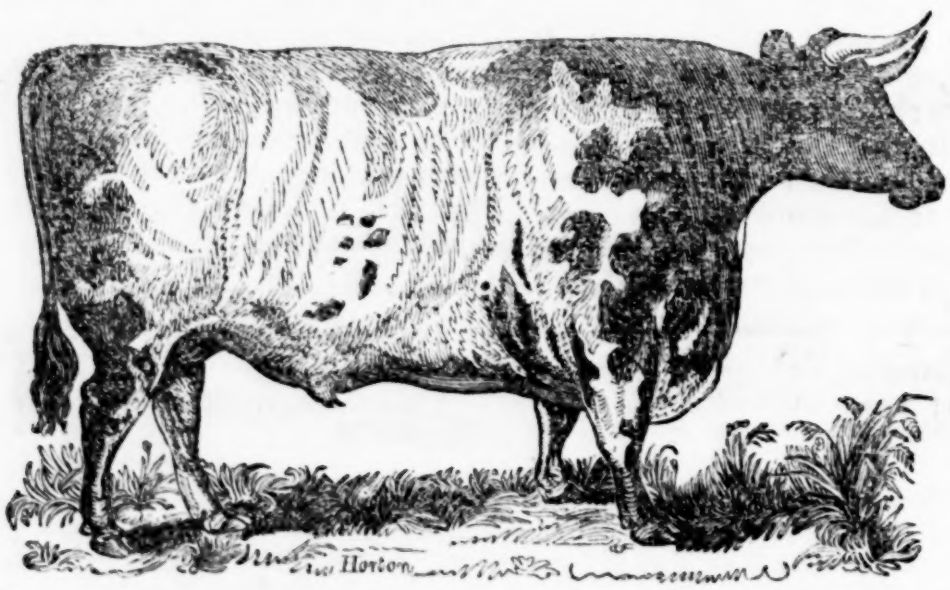
* See the Agricultural Survey of Herefordshire, p. 118, and a Paper by T. A. Knight, Esq., in Communications to the Board of Agriculture, Vol. II.

† See Chapter II.



V. The *Short Horned Cattle*, under which denomination are indiscriminately included the *Dutch*, *Holderness*, and *Tees-water breeds*, are supposed to have acquired the appellation of Dutch, from a

cross with some large bulls that were imported, near a century ago, from Holland into Yorkshire, in the east and north ridings of which county the two latter had been long established. It has, however, been doubted whether any advantage was derived from this intermixture; for the increase thus obtained in size was thought to have been counterbalanced by a more than proportionate increase of offal. But, fortunately, the error was not universal; for some intelligent breeders aware, even at that day, of the superiority of symmetry to bulk, preserved the breed of which they were already in possession, in its native purity; and it is from some of that stock, so maintained, or, at least, from a cross between that stock and some of the progeny of the Dutch and Tees-water cross, that the present improved short-horned cattle, now generally distinguished as the *Durham*, or *Yorkshire breed*, are descended.

This breed was introduced about forty years ago, by the Messieurs Collings, of Darlington, and has rapidly risen in the public estimation. The cattle are very large, and are beautifully mottled with red or black upon a white ground; their backs level; throat clean; neck fine; carcass full and round; quarters long; hips and rumps even and wide: they stand rather high on their legs; handle very kindly; are light in their bone, in proportion to their size; and have a very fine coat, and thin hide. They differ from the other breeds, not only in the shortness of their horns, but as being wider and thicker in their form, and consequently feeding to greater weight; in affording the greatest quantity of tallow when fatted; and in having very thin hides, with much less hair upon them than any other kind except the Alderneys. They also possess the valuable properties of fattening kindly at an early age, and of yielding large quantities of milk; but the quality of the latter is not so rich as that of some other species;* they are, besides, rather tender constitutioned, and, consequently, difficult and expensive to winter.

Of this breed, Mr. Charles Colling, of Ketton, sold a bull—*Comet*—by public auction, in the year 1810, for the extraordinary sum of one thousand guineas; and the history of the celebrated *Durham ox*, the property of the same gentleman, is too remarkable not to merit attention.

He was bred in the year 1796, and at five years old was not only covered thick with fat upon all the principal points, but his whole carcass appeared to be loaded with it, and he was then thought so wonderful an animal, that he was purchased in February, 1801, for £140, to be exhibited as a show: his live weight being then 226 stone, of 14 pounds. In the following May he was again sold for £250, to Mr. John Day, who, two months afterwards, refused for him two thousand guineas! He was exhibited in the principal parts of the kingdom until April, 1807, when he was killed, in consequence of having accidentally dislocated his hip in the previous February, and although he must have lost considerably in weight during his illness, besides the disadvantage of six years' travelling in a caravan, yet his carcass weighed 187 stone 12 pounds;* and Mr. Day stated his live weight at ten years old, to have been 270 stone.

Uncommon as this animal then was, he has, however, been since exceeded in size by a Yorkshire ox, bred by Mr. Dunhill, of Newton, near Doncaster, the carcass of which weighed, when killed, 264 stone 12 pounds; and he was supposed to have lost near forty stone while being exhibited in London.

Still more recently, another beast of uncommon size, fed by Lord Yarborough, has been exhibited under the title of "*the Lincolnshire ox;*" but, though bred in that county, from a favorite cow belonging to Mr. Goulton, he was got by a descendant of Comet, out of Countess, also of the Durham breed.† This extraordinary animal measured five feet six inches in height at the shoulders, eleven feet ten inches from the nose to the setting of the tail, eleven feet one inch in girth, and three feet three inches across the hips, shoulders, and middle of the back; the lowest point of his breast was only fourteen inches from the ground, and he stood one foot ten inches between the fore legs; the girth of the fore leg was nine inches.

The variety of this breed known as the Yorkshire Polled cattle, only differs from those already described, in being without horns; it is in considerable estimation among the London cow-keepers, as the cows are considered capital milkers, and at the same time maintain their flesh in a state nearly fit for the shambles.

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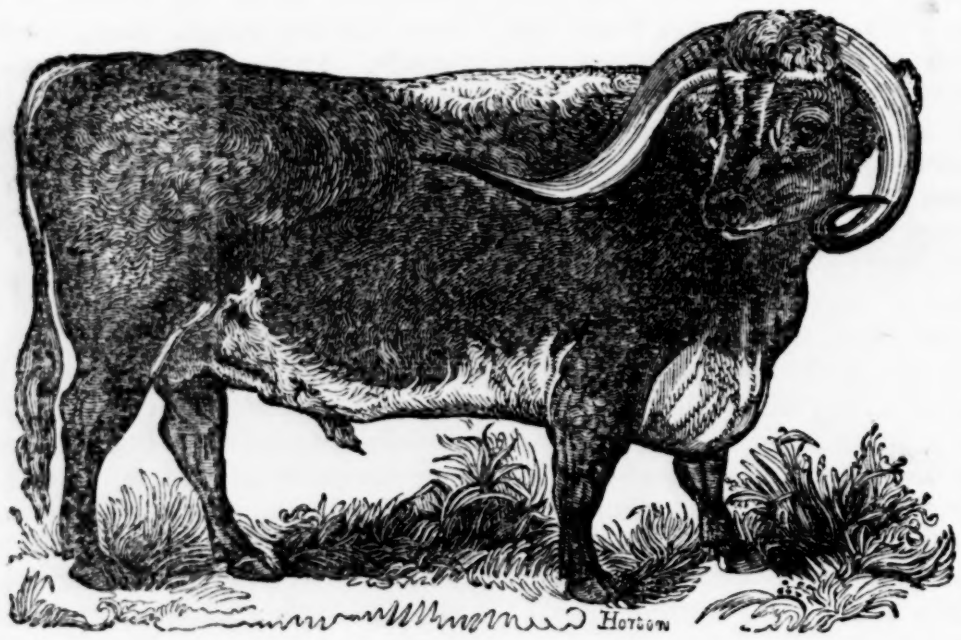
* See the Agricultural Surveys of the West Riding of Yorkshire, p. 248; and of Northumberland, p. 139.

	St.	lbs.	
* Viz. Four Quarters	165	12	See Agricultural Survey of Durham, p. 230; and Mr. Day's Descriptive Pamphlet.
Tallow -	11	12	
Hide - -	10	2	
	187	12	

† The native Lincolns are described by Mr. Stone, in his Survey of the county, as "generally large in the head, horns, bones, and bellies; thick, short, and fleshy in their necks and quarters; narrow in their hips, plates, chines, and bosoms; high in their rumps, and their shoulders not well covered; their eyes small and sunk in their heads." p. 57.



VI. The *Long-horned cattle* are descended from a breed which had long been established in the Craven district, in Yorkshire; some cows of which race, and a Lancashire long-horned bull, of the kind delineated above, were brought, early in the last century, by a Mr. Webster, to Canley, in Warwickshire, where they produced a stock that soon became remarkable for its beauty.

Of this *Canley stock*, the late Mr. Robert Bakewell, of Dishley, in Leicestershire, procured some cows, which he crossed with a Northumberland bull,* and thus reared that celebrated race now so well known as the *Dishley breed.* They were long and fine in the horn, had small heads, clean throats, straight broad backs, wide quarters, and were light in their bellies and offal; and, probably from the effect of domestication and gentle treatment, remarkably docile: they grew fat upon a smaller proportion of food than the parent stock; but gave less milk than some other breeds; and the chief improvements effected seem to have been, in their aptitude to fatten early on the most valuable points, and in the superior quality of the flesh.

Notwithstanding the deservedly high reputation, as a breeder, enjoyed by Mr. Bakewell during his life, and which still attaches to his name, his judgement in selecting the long-horned cattle for his experiments has been called in question; and it has been asserted, "that had he adopted the *middle-horned breed*, either of Sussex, Devonshire, or Herefordshire, in preference to the inferior stock which the reputation of his name, and the mysterious manner in which his breeding system was conducted, have introduced, it would have contributed to exalt the superiority of his stock, beyond the power of local prejudices to remove."† The removal of local prejudice is not, however, an easy task, even when ill-founded, which it would be too much to assume in the present instance; for, whatever may be the merits of the long-horned cattle, comparatively with other breeds, it must be admitted, that they rank among the finest in the kingdom; and it is certain, that the perfection which they have attained in the hands of the eminent breeders of the present day, has been acquired through the medium of the Dishley blood.

With regard to the "mysterious manner," in which Mr. Bakewell has been too generally accused of having conducted his business, it is a charge so vague and undefined, as hardly to merit remark; yet, as it conveys somewhat of reflection upon his character, it may be due to his memory to enquire upon what foundation it rests, and if examined closely, it will resolve itself into this:—that he was gifted with more than common acuteness of observation, judgement, and perseverance; which, combined with the experience he had acquired under his father, (who was also a distinguished breeder in his time,) he unremittingly applied to the improvement of cattle. Such qualities, directed to any one object, could not fail of success; and such, it may be fairly presumed, were the only mysteries he employed. That his practice was not open to the inspection of every one who sought to profit by it, will not surprise any person who is acquainted with the rivalry of eminent breeders; and, however it may be regretted that he has not left any record of his experiments, yet, as no man is bound to publish his transactions, his having omitted to do so cannot justly be made a ground of accusation.

The modern improvements made in the long-horned cattle, since the first attempts of Bakewell, are considered to consist chiefly in the coarser parts having been reduced, and the more valuable enlarged. The present breed is finer boned, and finer in the neck, throat, and breast; the back is straight, wide, and well covered with flesh; the rump is also wide, and particularly fleshy on the points, and about the root of the tail. Even when only in store order, the flank feels thick and fleshy, and in every part the animal handles loose and mellow.

Such, indeed, were always the distinguishing points of these cattle; but they were not thought attainable except they were fed on the richest pasture. This, however, has proved to be an error; for not only are they now found on land of no extraordinary quality, but it even appears to be generally admitted, that well bred cattle will do better on ordinary food than those of an inferior kind; it was indeed asserted by Bakewell, that this breed kept themselves in good condition on

* See Agricultural Survey of Leicester, p. 218. Mr. Marshall says, "*a bull purchased in Westmoreland;*" but he does not state the breed. See his Rural Economy of the Midland Counties, Vol. I. p. 269.

† Rev. Mr. Young: Agricultural Survey of Sussex, p. 226.

less food than any other of equal weight,* an opinion that seems to have been fully justified by the large prices that have been repeatedly given for the stock.†

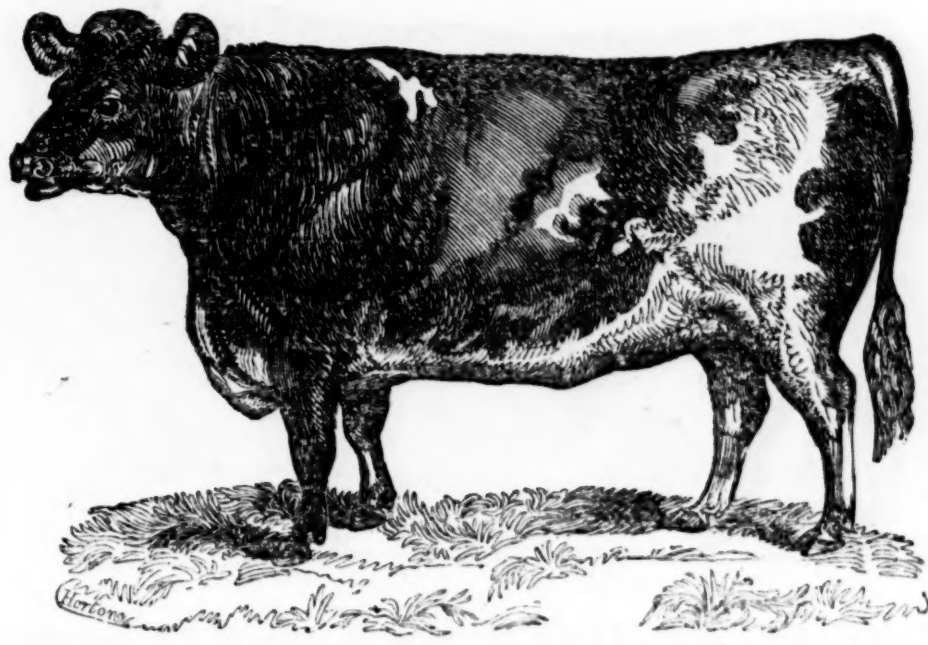
* See the Agricultural Survey of Leicestershire, p. 219, and Chapter II.

† At a sale of Mr. Fowler's stock (of this breed at Little Rollright, in Oxfordshire, in 1791, fifteen head of oxen, five bulls and ten cows, were sold for various sums, amounting to £2464, or upon an average, at £164 each. The finest bull, named Sultan, only two years old, produced *two hundred and ten guineas;* and *Washington*, another of the same age, was sold for *two hundred and five guineas;* while *Brindled Beauty*, a cow, brought the sum of *two hundred and sixty guineas;* but, at a subsequent sale of stock belonging to Mr. Paget, in 1793, Shakespeare, a bull, bred by Mr. Fowler from a grandson of Mr. Bakewell's famous bull, Twopenny, and a cow of the Canley blood, was disposed of for four hundred guineas.

At a still later period, Mr. Princep, of Croxhall, in Derbyshire, is said to have refused £2000 for twenty long-horned dairy cows, and 1500 guineas for the use of his best bull to thirty cows.

Large as these prices were, they have however, been exceeded by those actually obtained for short-horned cattle. At the sale already alluded to, of Mr. Charles Colling's stock, at Ketton, in the county of Durham, in 1810, seventeen cows and eleven bulls produced £4918, being an average of £175 10s. each. Of these two cows, Countess and Lilly, both got by Comet, were sold, the one for four hundred, and the other for four hundred and ten guineas. Petrarch, a bull, by Favorite, the sire of Comet, brought three hundred and sixty-five guineas, and Comet himself one thousand!

Still more recently, however, in February 1827, at a great sale of stock, the property of Mr. Rennie, of Phantassie, in East Lothian, (which amounted to the large sum of £13,582,) the highest price obtained for a bull of this breed was £115 10s., and for a cow £63; but, as not more than half the stock on the farm was supposed to have been sold, it is probable that some of the best cattle were reserved. Many other instances might however be adduced to prove—not that the relative value of the short-horned cattle has declined—but that extravagant prices are not now so generally given for superior stock, as formerly.



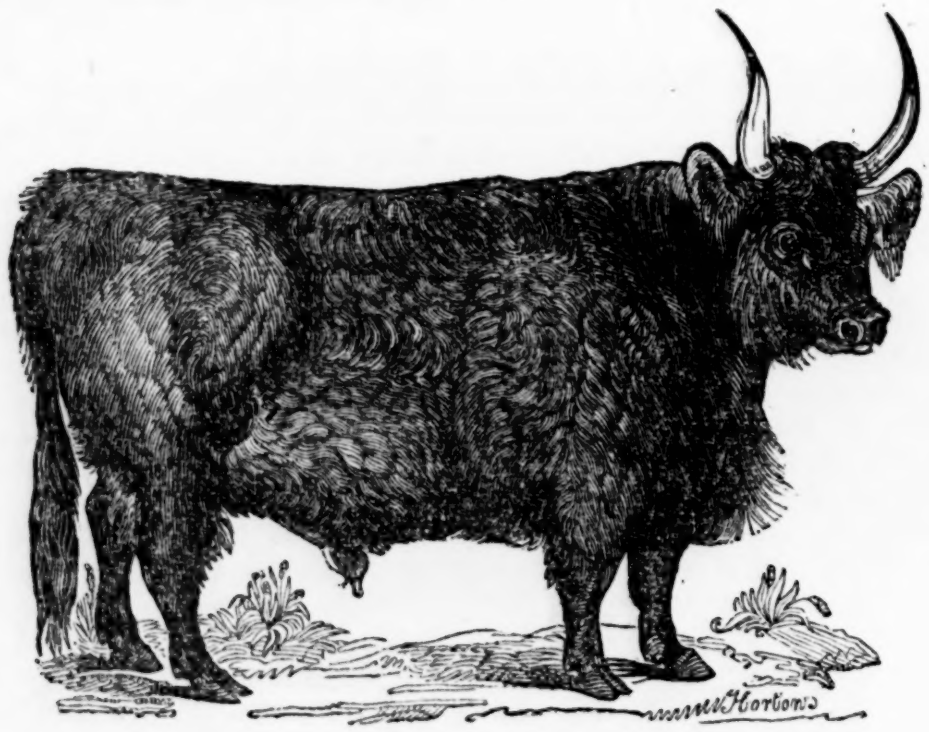
VII. The *Galloway breed* derives its appellation from the county of the same name, where, and also in some parts of the Lowlands of Scotland, these cattle are chiefly reared, and whence vast numbers are annually sent to Norfolk, and other English counties, to be fattened for the markets. In general they are black, or dark brindled; are without horns, except occasionally a small excrescence resembling them, and are rather under the medium size, being smaller than the Devons, though in some other respects resembling them, yet considerably larger than the north, or even the west Highlanders.

A true Galloway bullock is straight and broad in the back, and nearly level from the head to the rump; closely compacted between the shoulder and ribs, and also betwixt the ribs and the loins; broad at the loins, but not with hooked or projecting knobs. He is long in the quarters, but not broad in the twist; deep in the chest, short in the leg, and moderately fine in the bone; clean in the chop, and in the neck. His head is of a moderate size, with large rough ears, and full, but not prominent eyes, and he is clothed in a loose and mellow, though rather thick skin, covered with long, soft, and glossy hair.

In roundness of barrel, and fulness of ribs, the Galloway cattle may perhaps vie with even the most improved breeds. Their breadth over the hook-bones is not, indeed, to be compared to that of some of either the short or long-horned, but their loins bear a greater proportion in width to the hook-bones, and they are shorter between the hooks and the ribs, which is in itself a valuable point, when accompanied with length of body. They are, however, rather coarse in the head and neck. Although short in the leg, they are generally fine in the bone; for, notwithstanding the prejudice that formerly prevailed in favor of large bone, the Moorland farmers, convinced that large boned cattle could not thrive on their barren hills, never aimed at increasing the size of bone above what their pastures would carry, and by this judicious management have preserved the Galloway breed in its purity. It is, however, to be regretted that sufficient attention has not been paid to its improvement; and in many parts of the Lowlands it has been materially injured by an inconsiderate intermixture with Irish and Ayrshire cows, in consequence of a prevalent idea that the latter are superior milkers. Bulls of the most approved kinds have indeed been introduced from England, but without any apparent benefit to the native stock; and although a cross between this and the

short-horned breed, which is not uncommon in the border counties of England, is said "to produce an excellent animal, possessing in a great degree the feeding qualities and best points of the short-horn, and the hardiness and docility of the Galloway cattle;" it is yet added, "that although the first cross with the short-horn does produce a good beast, no good breeder would choose to continue his stock from these crosses;"* and it seems to be now generally admitted, that the surest method of improving it consists in adherence to the pure breed. They certainly merit attention, for they already possess many valuable properties, which may yet be brought to still greater perfection. They are a hardy race, subsisting on the coarsest pastures, and increasing rapidly when removed to more favorable situations: they fatten kindly on the best parts; their flesh is of the finest quality; and the joints being of a moderate size, more suitable for consumption in private families than those of the larger breeds, they usually command the highest prices at Smithfield.*

Of this breed there is a variety termed *Suffolk Duns*, from their color, which is generally of a yellowish hue, and from the county in which they were chiefly adopted. They are also polled, but possess little of the beauty of the original stock, and are chiefly remarkable for the abundance of milk given by the cows, on which account they are favorites with the London dairymen; the best milkers being said to give as much as eight gallons a day after claving, and six during great part of the season, wherefore much pains are taken to preserve the breed, and horned calves are never reared†.



VIII. The *Highland Breed* of Horned cattle are chiefly reared in the western parts of Scotland. Their horns are usually of a middle size, bending upwards, and their color is generally black, though sometimes brindle, or dun. Their hides are thick, and covered with long hair of a close pile, which nature seems to have intended as a protection against the severity of the climate under which they are bred, for they lose much of this distinction when reared in this country. In other respects they are not unlike the Galloway breed, many of whose best qualities they possess, and more particularly their hardiness of constitution, it having been repeatedly proved that they will thrive with such food and treatment as no tender cattle could endure; but, from being mostly bred in more exposed and mountainous situations, they rarely attain equal size.

Of this breed there are several distinct varieties, of which the principal are the *Kyloes*,—a short-horned breed, so named from the district of Kyle, in Ayrshire,—which are chiefly esteemed for the superior quality of the milk given by the cows: the *Argyleshire*, which are the largest of the real Highland breeds, and possess most of the properties already enumerated, except that they do not milk so well as the Kyloes; and the *Dunlops*, another variety, so called from the estate on which they were originally bred, which has long been celebrated for the excellence of its cheese. These last are said to have been produced from a cross between a Highland bull and an Alderney cow, or, as some say, from an Alderney bull and an Ayrshire cow; but an experienced breeder, who has been long resident in the county, is of opinion that the improvement of the native stock is due to the introduction, about the middle of the last century, of some Dutch or Teeswater cows.‡ Their color varies from a dark brown, approaching that of the Devon, to the cream color of the Alderney, and in both cases generally speckled with white. The head and horns are small; the neck thin; little dewlap; round and straight in the barrel, and perfectly free from any disposition to rise in the back bone; the loin, and space between the hips, flat and wide; in the leg rather short than otherwise, bearing a general similarity to the breed from which they spring. In some parts they are known under the name of *Cunningham cattle*, also from a district so called in Ayrshire.§

* Library of Useful Knowledge: Farmer's Series, No. 12: Farm Report of Netherby in Cumberland.

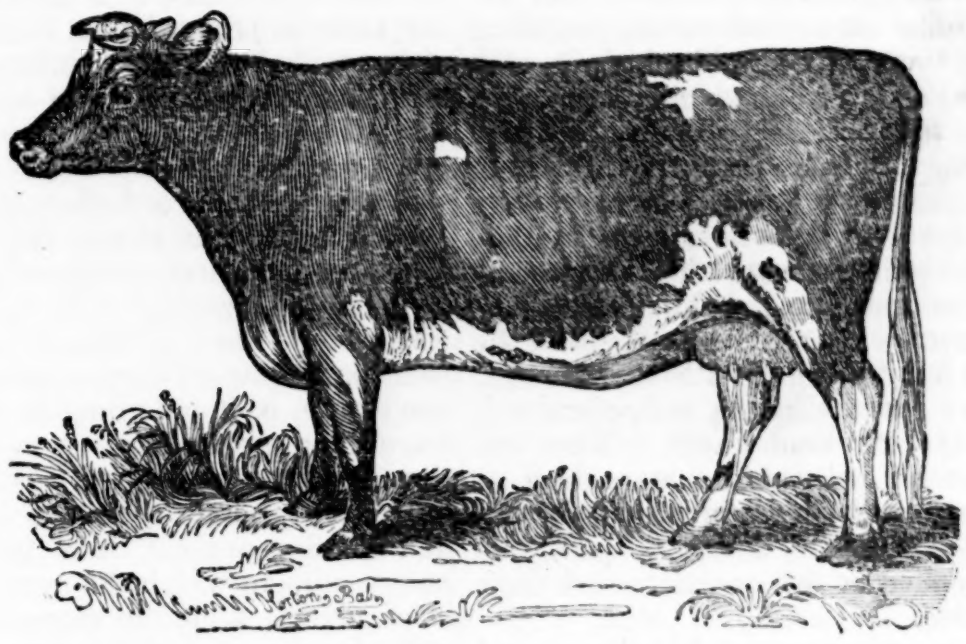
* See p. 34.

† Young's Survey of Suffolk.

‡ W. Aiton: Treatise on the Dairy Breed of Cows, p. 22.

§ See the Agric. Surv. of the Isle of Man, p. 107.

The *Ayrshire Breed* ranks deservedly high in the estimation of dairy-men, and the most approved form of the best milkers is thus stated by Mr. Aiton, to whom we are indebted for the annexed portrait.



"Head small, but rather long and narrow at the muzzle; the eye small, but quick and lively; the horns small, clear, bended, and the roots at a considerable distance from each other; neck long and slender, and tapering towards the head, with little loose skin hanging below; shoulders thin; fore-quarters light and thin; hind-quarters large and capacious; back straight, broad behind, and the joints and chine rather loose and open; carcass deep, and the pelvis capacious and wide over the hips, with fleshy buttocks; tail long and small; legs small and short, with firm joints; udder capacious, broad and square, stretching forwards, and neither fleshy, low hung, nor loose, with the milk-veins large and prominent; teats short, pointing outward, and at a considerable distance from each other; the skin thin and lose; hair soft and woolly; the head, horns, and other parts of least value small, and the general figure compact and well proportioned."

Besides these, there are the *Isle of Sky*, or *Western Kyloes*, and the *Norlands*, from the counties of Ross, Southerland, Inverness, and Caithness—which are smaller than those already enumerated, —and a mixed race, partly horned, and partly polled; black, brindled, dun colored; which are annually driven in large numbers from the north to the English fairs, where they pass under the common appellation of *Scots*. They partake, in general, of the Galloway kindliness to fatten, and goodness of flesh; and, on the richer pastures of the south, soon become ready for the butcher.

The original *Welsh Breed* is supposed to have been the same as that which still exists at Chillingham, and is said to have been wild in the mountains so late as the reign of King John. From intermixture with lowland cattle, and subsequent crosses, various kinds are now found throughout the principality, almost differing as much from each other as the counties in which they are severally bred. That most generally known is distinctively called the *Anglesey breed*, though by no means confined to that part of the country. They are chiefly black, slightly marked with white, and have thick horns, of a medium length, curving upwards. They are small, and short in the leg, but well proportioned, and clean, though not smalled-boned with deep-barrelled bodies, high and wide hips, deep chest, large dew-lap, and thin but commonly rough hides. They were favorites with Bakewell, who considered them as nearer to perfection—in some points—than any other except his own improved breed. The average weight of their quarters, when fat, at four years old, is from eight to eleven score pounds. They are very quick feeders, and make excellent beef; and the cows are generally good milkers.

The best kinds of this race of cattle are principally bred in the counties of Cardigan and Glamorgan, and in the southern and midland English counties, where they are in considerable demand for stocking inferior pastures. The small and hardy species, reared upon the mountains are commonly termed *Runts;* but they are far from being as despicable as might be supposed from that epithet, for they support themselves upon the hardest fare, thriving where some others would starve, and they are unrivalled as cottagers' cows. There is, however, a larger breed of brown color intermixed with white, and also having white horns; but they are long in the leg, thin in the thigh, and narrow in the chine. They are neither so compact as the black cattle, nor do they fatten so kindly, or make such good beef; but, though not in esteem with the grazier, they are active, and well adapted for the yoke.

X. The Alderney Breed are so named from the island, on the coast of Normandy, whence they were first imported, although they are also bred in the neighbouring islands of Guernsey and Jersey. The cows are small sized, but the oxen frequently attain a bulk and stature quite disproportioned to the female. Their color is either light red, dun, or cream-colored, mottled with white; the horns short and gracefully curled, and the bone fine.—They are chiefly valued for the dairy; and the best cows are observed to have a yellowish circle round the eye, with the skin at the extremity of the tail of a deep yellowish color approaching to orange: a remark, it may be noticed, that has been made on good milkers of other breeds.

Although the breeds throughout the Norman isles is nearly similar, yet that of Jersey is said to be better than that of Guernsey: it is certainly

smaller and more delicate; and so anxious are the inhabitants to preserve it in its native purity, that there is an act of their legislature which prohibits the importation of all foreign neat cattle whatever —even from the neighboring islands—under severe penalties of fine and confiscation, including the destruction of the animal itself, which in such case is slaughtered and distributed among the poor. When exported, the same act directs that they shall be accompanied by a certificate of their being natives of the island; but it is not easy to procure those of the best quality*. As fatting cattle, they have but few good points; being thin and hollow in the neck, hollow and narrow behind the shoulders, sharp and narrow on the hucks, light in the brisket, and lean on the chine, with short rumps, and small thighs; but their flesh is fine grained, high colored, and of excellent flavor. They are also very large in the belly; but this, as well as some of the points already mentioned, is rather an advantage to milch cows, to which purpose this stock is usually applied in this country; and their udder is well formed.

The Alderney cows are very rich milkers; and both on that account, and because of a certain neatness in their appearance, notwithstanding the defects of thir shape, they command high prices. In this county, therefore, they are mostly in the possession of gentlemen who, rarely keeping a regular breeding stock, the cows are consequently crossed by any neighboring bull, and thus the pure breed is preserved in the hands of but very few persons.

There is a very prevalent notion that they will thrive on any kind of land, and they are therefore not uncommonly kept on bare paddocks, with the assistance of hay in winter. Like all light cattle, they certainly do not require the same support as larger animals; but their native pasture in the islands, is of the richest kind; and it is doubtless owing to the less nutritive herbage on which they are frequently fed in England, that the quantity of their milk is not equal to its quality. In Jersey they are also fed partly on parsnips, which are found to improve the produce of the cows.†

Such are the chief breeds of the kingdom; and the description, being taken from the best authorities, may be considered as accurate as possible, in a general view. But it must be admitted, that there are great deviations in many animals of the same, and of the most approved stock; and there are, besides, many crosses, and local breeds, distinguished by the name of the district, or the breeder, which it would be tedious to particularise.

Comparative view of the different breeds of neat cattle.

From the previous introductory view of the various species of neat cattle, the reader will probably be enabled to form some estimate of the value of the respective breeds therein described. The two kinds, however, which are chiefly reared, are the *long-horned* and the *short-horned*, and, concerning their merits and demerits, there has long been a difference of opinion among the most experienced breeders; on that subject, therefore, it may not be altogether useless to offer a few comparative remarks to the consideration of the young grazier.

* Quayle's General View of the Norman Isles.
† See Book II. chap. 2, note.

It has been observed, by Mr. Culley, that "the long horns excel in the thickness and firm texture of the hides, in the length and closeness of the hair, in their beef being finer grained and more mixed and marbled than that of the short horns, in weighing more in proportion to their size, and in giving richer milk; but they are inferior to the short horns, in giving a less quantity of milk, in weighing less upon the whole, in affording less tallow when killed, in being slower feeders, and of a coarser make, and more *leathery* or *bullish*, in the under side of the neck. In few words, the long horns excel in the hide, hair, and quality of the beef; the short horns in the quantity of beef, tallow, and milk.—Each breed has long had, and probably may have, their particular advocates; but, if I may hazard a conjecture, is it not probable that both kinds may have their particular advantages in different situations? Why may not the thick, firm hides, and long close-set hair of the one kind, be a protection and security against those impetuous winds and heavy rains to which the west coast of this island is so subject; while the more regular seasons and mild climate, upon the east coast, are most suitable to the constitutions of the short horns?" *

It should, however, be understood, that the preference above given by Mr. C. to the long-horned species, on account of the superior quality of their beef, applies only to the variety of that breed which was selected, improved, and recommended by the late eminent Mr. Bakewell, and which is described in the introductory view already referred to, under the name of *Dishley breed*. In fact, Mr. C. is of opinion that "a breed of short-horned cattle might be selected, *equal*, if not *superior*, even to that very *kindly-fleshed* sort of Mr. Bakewell's, provided any able breeder, or body of breeders, would pay as much attention to these as Mr. Bakewell and his neighbors have done to the short-horns." †

This, as the opinion of an eminent breeder, is entitled to great attention; and it has been corroborated by a fact stated in the Agricultural Survey of Northumberland, "that the long-horns had been introduced into that country from the improved stocks of the midland counties, at different times, and by different breeders; but had, in most instances, given way again to the improved breed of short-horns, and, at the time the first report was published in 1804, had been totally abandoned by every breeder in the country; the improved breed of short-horns, from the stock of the Messieurs Colling, having proved themselves much superior." ‡

Since that period, continued exertions have been made for the improvement of the short horned breed, and the great weight to which the cattle arrive must always ensure them a high rank in the estimation of those graziers who possess land of sufficient staple to forward heavy beasts; but the opinion of many of the best judges still continues to be divided regarding their comparative merit with that of the long-horns.

An experienced farmer, who appears to have examined both the breeds with great impartiality, states, "that the best of the short-horned being larger than any other kind require good keep, and more age than cattle in general: the oxen will improve to the age of seven years, and the cows to

* Culley on Live Stock, p. 80. † Ib. p. 81.
‡ Page 140, 3d edition, 1813; in which the assertion remains uncontradicted.

six; and if they are not well supported when young, will require another year: that they have large bones, and are said to be coarse-grained, and the beef not so marbled as that of some other kinds; though some of them die very fine beef." But he adds, "that many have larger shoulders* than the Rollright [*long-horned*] breed: that the best of this breed, especially the heifers and cows, are formed for the butcher superior in shape to any other kind; and that, of the four kinds of cattle put in competition with the Rollright, viz. the Devon, the Sussex, the Hereford, and the Yorkshire, [*short-horned,*] he is of opinion that none, at an early age, equal them for slaughter, or will pay so much money for three years' consumption."†

In confirmation of this, there is an opinion stated in several of the agricultural surveys of different counties, "that for beauty and symmetry of parts and disposition to fatten, the long-horned cattle are not to be excelled by any of their contemporaries;" ‡ "that they come quickest to perfection;" § "are preferable to short-horns, better feeders, and lay most beef in the best joints; are more thrifty on poor land, and are preferred at Smithfield." ‖ Yet notwithstanding the decisive tone thus assumed, the question of superiority may still be considered as undecided: each have their advocates. Thus the Hereford surveyor gives a decided preference to the oxen bred in that county, although he admits, that the long-horned cows are equal to the Herefordshire.¶ The Somersetshire graziers will not allow that the north-country oxen possess any merit, comparatively with the Devon, either for labor or slaughter; but the surveyor himself, while maintaining their superiority in the yoke, is candid enough to admit, "that they have many rivals in the Galloway, Leicester, Hereford, Glamorgan, and other cattle."** The late Mr. Davis, of Longleat, an eminent agriculturist, although allowing that the comparative merits of the Devon and long-horned breeds are warmly contested in Wiltshire, yet, gives it as his opinion, "that whatever may be the comparative merits of the two kinds of cows for the dairy, there is not a doubt but the Devonshire kind are the most proper for fatting; and, as to the oxen bred from the two kinds, it would be injustice to the Devonshire oxen even to make a comparison between them."†† Further trials of their respective qualities must be accurately made and faithfully recorded, before an undisputed preference can be awarded to either; for it cannot be concealed that local prejudice is often opposed to fact. The long-horns appear best adapted for grazing; being well protected by thick hides and long hair, and seemingly intended by nature for the range of pasture land. The short-horns, on the contrary, have thin hides and short hair, and being of a more tender constitution than the former, and arriving to greater weight, seem better calculated for the system of stall-feeding; while the Devons have the advantage as working oxen.

The next in size to the short-horned, are the *Hereford;* the oxen of which breed commonly attain the weight of 70 to 100 stone, of fourteen pounds, and frequently arrive at much greater size. They are considered by a competent judge, * when compared with other fashionable breeds, "as rather larger in the bone, and somewhat shorter in the carcass; rising a little higher in the chine, towards the shoulders, but generally broad, which renders the chine thick and heavy. Their hucks are round, wide from one to the other, and well covered with fat; their rump is well formed, and the thigh rather heavier than some delicate breeds. Their shoulders are mostly large, in consequence of which they have more coarse boiling beef than they ought, and, notwithstanding they have a great propensity to fatten and die well filled with fat, it is often irregularly placed in patches." This defect is, however, probably owing to their having been worked; for although oxen that have been for several years at the yoke, will often become fat, it has been remarked that they are seldom so equally proportioned in every part with fat and lean as unworked steers, nor is the meat so juicy, and the brisket and lower parts are generally tough. When slaughtered at a proper age, the Herefords are heavily fleshed, the meat is fine in the grain and regularly marbled, with a better proportion of fat and lean than most other cattle, and they deservedly hold a high place in the estimation of the butchers. A writer of considerable experience on the subject, who has lately published a very interesting memoir of the short-horned breed, gives the preference to the *improved short-horns,* which he considers equal, at three years old, to Hereford cattle at four years old; and the cows as more profitable for the dairy. For *breeders,* he therefore decidedly recommends the short-horns; but he admits that the Herefords may be purchased with equal profit by *graziers,* whose only view is to fatten them for the market, because they will not—in a lean state at four years old—bear an increased price proportioned to the additional time required to render one of them equal to a short-horn of three years. †

An interesting experiment made at the Earl of Egremont's farm at Petworth, in Sussex, might, if it stood alone, be considered as, in a great measure, decisive of the relative value of this breed, as fatting cattle, to those of Devon and Sussex.—Eight beasts of the three breeds, taken indiscriminately from the stock, were put up to fatten on a mixture of barley-meal and flax-seed. For the first seven weeks they had each three gallons every day, of which one-fourth was flax-seed; and for the remainder of the time they had three gallons, of which one-third was flax-seed, ground together and mixed up with some wheat-chaff, both to facilitate digestion, and prevent it from sticking in their throats. Besides this, they had each thirteen pounds of hay weighed to them three times each

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* This, it should be observed, is a defect; for although the shoulders cannot be deemed offal, yet are they, comparatively, loss, as the flesh is of less value than that on the rump, loins, and chine: wherefore, the most perfectly formed cattle are those that are the longest, and have the smallest shoulders in proportion to their size.

† Parkinson's Treatise on Live Stock, Vol. I. ch. 1. sect. 15.

‡ Leicester Report, p. 218. ‖ Rutland ditto, p. 121.

§ Lincoln Report, pp. 337, 339, 341, 2d edition.

¶ Hereford ditto, p. 118.

**Somerset ditto, pp. 242, 243, 3d edition.

†† Wilts ditto, pp. 204, 205, 2d ditto.

* Mr. Richard Parkinson, Treatise on Live Stock, Vol. I. ch. 1, sect. 16.

† See an Essay entitled "Improved Short horns, and their pretensions stated," by the Rev. Henry Berry, of Worcestershire, 1830.

day. They were sixteen weeks fattening, and their respective weight when put up, and when fatted, was as follows:—

	Nov. 27.	March 19.	Gain.	
	cwt. qs. lbs.	cwt. qs. lbs.	cwt. qs. lbs.	
No. 1.	17 0 7	20 2 0	3 1 21	Hereford.
2.	15 3 25	18 3 14	2 3 17	
3.	15 0 11	17 2 0	2 1 17	
4.	14 1 21	17 0 0	2 2 7	Sussex.
5.	14 0 25	17 0 0	2 3 3	
6.	14 0 25	17 0 0	2 3 3	
7.	13 2 7	16 2 0	2 3 21	Devon.
8.	13 0 14	15 0 0	1 3 14	

Thus, it will be perceived, that, *upon equal quantities of food*, the Herefords put on the most flesh; nor will it escape observation that, in that, the largest bullocks had the advantage. It has, indeed, been remarked, that the thorough bred Hereford cattle, that have attained their full size, require a less proportion of food to make them fat, than others of the same breed that are not so highly bred, nor so handsomely formed; and that, so far from requiring a larger quantity of food, they will consume a much less proportion than other smaller oxen of mixed breed.* To which it may be added, as a general remark, that, although small cattle will, on an average, consume less food than those of a larger size, yet the quantity is by no means in exact proportion to their weight; the advantage being usually in favor of the largest, when all other considerations are equal. On this particular trial it should also be noticed, that, although the plan of feeding on equal quantities was judiciously adopted, as a mean of ascertaining which breed would put on the most flesh with a limited amount of food, yet it cannot be deemed decisive of their relative qualities; for some would probably not have had sufficient to satisfy their appetite, and consequently would not thrive so fast as those which had enough, although, had they been allowed as much as they could eat, they might, perhaps, have increased in a more than equal proportion. Accordingly, another experiment, made nearly at the same time as the former, at Woburn, under the direction of the late Duke of Bedford, gives a different result, both as regards the breeds, and the weight of the cattle.

Six oxen, two Herefords, two Devons, one of the Sussex, and one of the Leicester long-horned, were put up at one time; and (with the exception of one of the Herefords, which had not any cake) were fed on equal quantities of oil-cake, *with as much turnips and hay as they could eat*, for an equal number of days, and their respective weights, at each period, were as follows:—

		Food given.	returned	consumed	1st weight	2d weight	Live wt. gained
					cwt. qrs. lbs.	cwt. qrs. lbs.	cwt. qrs. lbs.
No. 1. Hereford.	Turnips	3060 lbs.	360	2700	27 0 1	18 3 0	1 2 27
	Hay	530 "	43	487			
2. Ditto.	Oil-cake	450 "	26	424	18 1 0	21 0 25	2 3 25
	Turnips	3040 "	328	2712			
	Hay	467 "	34	433			
3. Devon.	Oil-cake	450 "	12	438	14 1 7	17 2 7	3 1 0
	Turnips	3090 "	422	2668			
	Hay	376 "	81	295			
4. Ditto.	Oil-cake	450 "	7	443	14 2 14	19 1 0	4 2 14
	Turnips	3000 "	364	2636			
	Hay	475 "	32	443			
5. Sussex.	Oil-cake	450 "	17	433	16 2 0	19 3 0	3 1 0
	Turnips	3030 "	375	2655			
	Hay	443 "	51	392			
6. Leicester.	Oil-cake	450 "	15	435	15 2 14	18 2 0	2 3 14
	Turnips	3010 "	358	2652			
	Hay	447 "	47	400			

From this it would appear, that the Devonshire cattle were superior, as the ox (No. 4) of that breed, gained 185 lbs. more flesh than the Hereford ox (No. 2) upon a nearly equal quantity of food, of similar quality; and, in farther contradiction to the former experiment, as well as to common observation, that, in this, the cattle throve in an inverse proportion to their weight, the smaller having the advantage. But it is also worthy of remark, that the difference was equally striking between the two Devons, though of equal weight; and this exemplifies the truth of an observation of daily occurrence, that cattle of the same breed, are yet of different constitution, and do not always possess an equal aptitude to convert their nourishment into fat. Thus it will be found, that of a score of bullocks of the same stock, age, and apparent quality, fed and managed alike, some will fatten much sooner than others, and arrive at greater weight; and that, in those which, when alive, appear equal to the eye and touch, a manifest difference will often be found when they are slaughtered. Therefore, however justly some breeds may be preferred, upon the general principle that the progeny partake of the disposition of the sire and dam, yet this theory is frequently contradicted in practice. The state of the parent

* See Agricultural Survey of Sussex, p. 243.

stock at the time of copulation, the health of the cow during the period of gestation, and the management of the calf during its growth, must all have an influence upon the future condition of the animal; and there are, doubtless, other hidden causes which have either escaped the observation, or are beyond the control of man. Experience has indeed proved, that although comparative experiments to ascertain the relative value of cattle are not to be slighted, yet that they are often contradictory; and, therefore, that the result is not always entitled to implicit faith.

In drawing a comparison between the Galloway and other most approved breeds, the surveyor of that district, although acknowledging their inferiority in respect of weight, yet maintains, that in many other of the most valuable qualities they do not come far short of any; and in the essential property of a tendency to thrive and fatten, the correctness of that opinion must be admitted; but it cannot be so readily conceded, as he asserts, "that when the merits of cattle come to be appreciated on just grounds, and the influence of quackish arts is at an end, many breeds which are now the most fashionable, will cease to attract attention; and the Devons and Kyloes will then, in all probability, be the only ones with which the Galloways will have to contend for pre-eminence."*

In support of this opinion, the surveyor has produced a table of the relative proportions between a Galloway cow and two acknowledged, as he says, to be the very best of the long and short-horned breeds, in all those points which are considered to be of the greatest importance: from an examination of which the preponderance would appear to be in favor of the former. Perhaps he attaches too much weight to these comparisons, for it is not in form alone that value entirely consists: many beautiful cattle are deficient in constitution; and others, though very plain, possess great aptitude to fatten, and are superior milkers. But the table merits attention. apart from any comparison, as it displays, at one view, the proportions of chosen animals of three different breeds, and therefore, it is presumed, cannot fail to interest the reader.

The late Mr. Bakewell made many comparisons between different breeds of cattle, and it is much to be regretted that the observations of so acute and intelligent a man, and one so deeply versed in the subject, should be lost to the public; but he was singularly incommunicative; and there is little further known of his experiments, than that he put up three new milched cows, in separate stalls—a short-horned, a Scotch, and one of his own breed—and the result was, that the short-horned ate most food, and gave much the greatest quantity of milk; the Scotch ate less food, and gave less milk, but produced most butter; and the Dishley ate least food, gave the least milk, and made the least butter, but laid on the most flesh; whence it would appear, that the Kyloe cows are superior to the other two for the dairy-man, and the long-horned cows for the grazier; but this is by no means decisive of the relative value of the oxen.

The relative estimation of the flesh of the principal breeds at Smithfield market, and the average difference in price for the best qualities of each, in January 1833, are as follows:—

	s.	d.		
Scotch oxen, ...	4	8	per stone of 8 lbs. to sink the offal.	
Leicester, Hereford, and fine short-horns	4	0 to 4s. 4d.	ditto	ditto
Lincoln short-horns,	3	10	ditto	ditto
Coarse inferior beasts,	3	6	ditto	ditto

That consideration, which this important subject requires, has of late years been amply bestowed upon the improvement of British cattle; and beside the respectable breeder already mentioned, the labors of the late and present Dukes of Bedford, the Marquess of Exeter, the Earl of Egremont and Viscount Althorpe, of the late Mr. Fowler, Lord Somerville, and Mr. Westcar, of the Messieurs Colling, Culley, and Kitelee, Mr. Princep, Mr. Mason, of Chilton, Mr. Ashley, and Mr. Coke, of Norfolk, as well as of many other noblemen and gentlemen who have recently applied themselves to agriculture, and whose exertions, both as amateurs and professionally, claim the gratitude and good wishes of every real friend to his country—the various excellent societies established in many parts of Great Britain for the promotion of this public spirited purpose, have mainly contributed to the high state of perfection which this important branch of rural science has attained.

It has been hinted, when discussing the subject of buying cattle, that it will be advisable to select them, either from stock feeding in the neighborhood, or from those sorts which are best calculated for the nature and situation of the soil. This remark should be constantly kept in view, with regard to the breeding of cattle; let, therefore, that breed which is most profitable and best suited to the situation of the farm, first be ascertained; and, having succeeded in this desirable object, let it be the breeder's study to improve that sort to the utmost, by selecting and breeding from those which to beauty of form unite the more essential qualities of possessing kindly skins, and of weighing most in the valuable parts, together with a disposition to lay fat on the best points, as well as to fatten in a short period of time.

Before we conclude this subject, it may not be amiss to notice the neat cattle reared in the sister island. Few countries are, perhaps, so well adapted for the breeding of cattle of every description; and it is in consequence of this peculiar felicity of soil and situation, that our fleets are supplied with the immense quantities of prime beef necessary for the support of their crews.

The breed of *Irish cattle*, of which many thousand carcasses are annually exported, is distinguished by little variety, excepting that which necessarily arises from the difference of situation. They are remarkable for strength of constitution; and appear to be a mixed race, between the long-horned breed and the Scotch or Welch cattle. The counties of Meath, Roscommon, Clare, Limerick, Cork, and Tipperary, are chiefly celebrated for the vast herds which are there annually bred and slaughtered for exportation; and many of the most public-spirited breeders have, of late years, incurred very considerable expense by purchasing prime stock from England for the purpose of improving their breeds; a measure that has already been attended with the most beneficial effects, and which will doubtless, in the course of a few years, prove a source of great wealth to that island. It, however, cannot be denied that these exertions have not hitherto been sufficiently general to effect any very manifest improvement in the com-

* Agricultural Survey of Galloway, p. 245.

mon stock of the country. The whole farming system of Ireland is defective; and, although grazing is better understood here than tillage, it is still in its infancy. The usual practice is to fatten in the field, on grass alone, without the assistance of artificial grasses, roots, or oil-cake. The beasts are purchased at the fairs without any regard to the breed; and being, in a large proportion, bred from

cottagers' cows, which are necessarily taken from the worst stock, they are commonly ill-shaped and ill-thriven. The truth is, that capital is wanting; but it is to be hoped that those unhappy dissensions which had destroyed confidence will now no longer distract so fair a portion of the empire, and that so promising a field for the enterprising agriculturist will not continue to suffer neglect.

A COW OF THE GALLOWAY BREED COMPARED WITH TWO OF THE BEST LONG AND SHORT-HORNED BLACK CATTLE.

	Brindled Beauty, bred at Glencaird, in Minnigaff. Height 44 inches.	Yellow Dishley, bred by Mr. Bakewell. Height 53 inches.	Difference.		Inches nearly.
	Proportion, as 45 to 54, or as 5 to 6.		In favor of Galloway.	In favor of Long Horns.	
	Inches. Inches.	Inches. Inches.	Inches.	Inches.	
Width of Hooks	20½ by 6 = 123	21½ by 5 = 107½	15½		2 3/4
Loin	15 " 6 " 90	16 " 5 " 80	10		1 3/4
Length of Quarter	18 " 6 " 108	19 " 5 " 95	13		2
Back	54 " 6 " 324	70 " 5 " 350		26	5 3/4
Space	8 " 6 " 48	10½ " 5 " 52½	4½		
Girth at the Rib	83¼ " 6 ", 499½	90½ " 5 " 452½	47		8
Chine	69 " 6 " 414	75 " 5 " 375	39		6½-8-1/4
Neck	29 " 6 " 174	35 " 5 " 175	1		
Shank	6 " 6 " 36	7½ " 5 " 37½	1½		
	Brindled Beauty, as above. Height 44 inches.	Phœnix, bred by Mr. Charles Colling. Height 56 inches.		In favor of Short Horns.	
	Proportion, 5½ : 7 = 44 : 55.				
Width of Hooks	20½ by 7 = 143½	26¾ by 5½ = 147⅛		3 5/8-7/8	1/2-1/8-1/2
Loin	15 " 7 " 105	19¼ " 5½ " 105 7/8			
Length of Quarter	18 " 7 " 126	21 " 5½ " 115½	10½		1½
Back	54 " 7 " 378	61½ " 5½ " 338¼	39¾		5½
Space	8 " 7 " 56	15¼ " 5¼ " 83 7/8	34 7/8		5
Girth at Chine	69 " 7 " 483	85 " 5½ " 467½	15½		2¼
Neck	29 " 7 " 203	38½ " 5½ " 211¾	8¾		1¼-1/8
Shank	6 " 7 " 42	7½ " 5½ " 41¼		3/4	

General observations on buying and stocking a farm with cattle.

The profit to be derived from the occupation of land, depends so much on the command of the requisite capital, that the most important consideration for a young beginner is to be well advised on this essential point, and to be assured that he possesses sufficient means to turn every acre to the best account: bearing in mind, that a small occupation, with ample capital, will ever be found more beneficial than one of larger extent without the power of employing it to the greatest advantage; and that, more ground is generally as easy to be got (if success should enable him to hire it,) as it is usually difficult to obtain more money. Assuming it therefore as certain, that such a beginner is provided with that indispensable requisite, we shall proceed to state a few general hints on the buying and stocking of his farm with cattle; and shall introduce, under the respective accounts of rearing and breeding the different species, such remarks on their various merits and demerits as will materially assist him in the course of his labors.

The first object of attention, then, is to consider the proportion between his stock and the quantity of feed which will be necessary to support them. The nature, situation, and fertility of the soils that compose his farm are equally worthy of notice, as well as the purpose for which he designs more particularly to rear or feed his cattle; whether for the pail, or with the view of supplying the markets. In fact, it will be expedient to observe the greatest exactness in this proportion, because, in case he should overstock his land, he will be compelled to resell before the cattle are in a fit state for the market, and, consequently, at certain loss; while, on the other hand, he will incur a diminution in his profit, if he should not stock his land with as many cattle as it will bear.

Formerly, a great prejudice prevailed in favor of big-boned, large beasts, but it has been ascertained that this breed is, in point of profit, much inferior to the middle-sized kind; and, by a careful attention to the selection of stock, no inconsiderable progress may be made towards the improvement of the different species. Among the various professional breeders of modern times, few have attained greater celebrity than the late Mr. Bakewell, of Dishley, to whom we are indebted for many new and important improvements in the science of rearing cattle. The principle which he invariably adopted was, to select the best beast, that would weigh most in the valuable joints; so that, while he gained in point of shape, he also acquired a more hardy breed; and, especially by attending to the *kindliness* of their skin,* he became possessed of a race which was more easily fed and fattened than any other.

For many years, the invariable practice was to judge by the eye only, without regarding the other qualities of the animal intended to be purchased; but, in the present improved age, a more rational mode of forming the judgement has been adopted. The sense of touch is now brought in aid of the sight; and, by repeated practice, the art of judging of the kindliness to fatten has been brought to such perfection, that any well informed breeder, who has personal experience, can, on examining lean beasts, tell, almost instantaneously, in what points or parts they will or will not fatten.

It might be expected that the result of such experience should be here stated, and some rules be laid down, by which a judgement on this important point could be formed; but, in fact, this knowledge can only be acquired by constant *handling* of both lean and fat beasts, and can only be described in general terms. Sir John Sinclair has justly remarked, that, "when the hide or skin feels soft and silky, it strongly indicates a tendency in the animal to take on meat; and it is evident, that a fine and soft skin must be more pliable, and more easily stretched out to receive any extraordinary quantity of flesh than a thick or tough one. At the same time, thick hides are of great importance in various manufactures. Indeed, they are necessary in cold countries, where cattle are much exposed to the inclemency of the seasons; and, in the best breeds of Highland cattle, the skin is thick in proportion to their size, without being so tough as to be prejudicial to their capacity of fattening."*

In the selection, therefore, of live stock in general, the young farmer will find it necessary attentively to consider the following particulars:—

I. *Beauty, or symmetry of shape;* in which the form is so compact, that every part of the animal bears an exact consistency, while the carcass should be deep and broad, and the less valuable parts (such as the head, bones, &c.) ought to be as small as possible. The carcass should be large, the bosom broad, and chest deep; the ribs standing out from the spine, both to give strength of frame and constitution, and likewise to admit of ample room for the intestines; but yet not so much as to be what is called *high-ribbed*, as the butchers consider it an indication of deficiency in weight of meat. Further, the shoulders ought not only to be light of bone, and rounded off at the lower point, but also broad, and well covered with flesh. The back also ought to be wide and level throughout; the quarters long, the thighs tapering and narrow at the round bone, but well covered with flesh in the twist; and the flank full and large. The legs ought to be straight below the knee and hock, and of a moderate length; light boned; clean from fleshiness, yet having joints and sinews of a moderate size, for the united purposes of strength and activity. In these points all intelligent breeders concur; but, as beauty of shape too often depends on the caprice of fashion, it is more requisite to regard,

II. *Utility of form*, or that nice proportion of the parts which has already been noticed.

III. The *flesh*, or texture of the muscular parts; a quality which was formerly noticed only by butchers, but the knowledge of which is justly deemed essential by the enlightened breeders of the present day; and although this quality necessarily varies according to the age and size of cattle, yet it may be greatly regulated by attention to the food employed for fattening them. As a knowledge of this requisite can only be acquired by practice, it is sufficient to state, that the best sign of

* As this expression may probably often appear in the course of the subsequent pages, it may not be altogether irrelevant to state, that it implies a skin which feels mellow, i. e. soft, yet firm to the touch, and which is equally distant from the hard, dry skin, peculiar to some cattle, as it is from the loose and flabby feel of others.

* "Hints regarding Cattle," p. 157, &c.

good flesh is that of being marbled, or having the fat and lean finely veined, or intermixed, when the animals are killed; and, while alive, by a firm and mellow feel.

IV. In *rearing live stock* of any description, it should be an invariable rule to breed from small-boned, straight-backed, healthy, clean, kindly-skinned, round-bodied, and barrel-shaped animals, with clean necks and throats, and little or no dew-lap; carefully rejecting all those which may have heavy legs and roach backs, together with much appearance of offal. And, as some breeds have a tendency to generate great quantities of fat on certain parts of the body, while in others it is more mixed with the flesh of every part of the animal, this circumstance will claim the attention of the breeder as he advances in business.

V. In the *purchasing of cattle*, whether in a lean or fat state, the farmer should on no account buy beasts out of richer or better grounds than those into which he intends to turn them; for, in this case, he must inevitably sustain a very material loss, by the cattle not thriving, particularly if they be old. It will, therefore, be advisable to select them, either from stock feeding in the neighborhood, or from such breeds as are best adapted to the nature and situation of the soil.

VI. *Docility of disposition*, without being deficient in spirit, is of equal moment; for, independently of the damage committed by cattle of wild tempers on fences, fields, &c., which inconvenience will thus be obviated, it is an indisputable fact, that *tame beasts require less food to rear, support, and fatten them;* consequently every attention ought to be paid, early to accustom them to be docile and familiar.

VII. *Hardiness of constitution*, particularly in bleak and exposed districts, is indeed a most important requisite; and in every case it is highly essential to a farmer's interest to have a breed that is liable neither to disease nor to any hereditary distemper. A dark color, and in cattle which are kept out all the winter a rough and curled *pile*, or coat of hair, are, in the popular estimation, certain indications of hardiness: but it must be obvious to every thinking person, that this quality, though in some respects inherent in particular breeds, depends, in a great measure, upon the method in which cattle are treated.

There is, indeed, a rather prevalent opinion, that white is a mark of degeneracy, and that animals of the most vivid hues possess the greatest portion of health and strength; in proof of which it has been instanced that among mankind, a healthy habit is visible in the floridness of the complexion, as sickness is perceptible in the paleness of the looks, and the decrepitude of age in the whiteness of the hair. It has also been remarked that gray horses are commonly of a tender constitution, until crossed with darker breeds, and that among the feathered tribe, the common poultry, with high colored plumage, are in all respects superior to the white. But it has been justly observed in reply, that the powerful Polar bears, and many of the strongest birds, as the goose and swan, are white; nor will it escape observation, as more immediately touching the present subject, that the wild cattle are invariably of that color, and that the highest bred Herefords are distinguished by white faces.*

VIII. Connected with hardiness of constitution is *early maturity*, which, however, can only be attained by feeding cattle in such a manner as to keep them constantly in a growing state. By an observance of this principle, it has been found that beasts and sheep, thus managed, thrive more in three years, than they usually do in five when they have not sufficient food during the winter, by which, in the common mode of rearing, their growth is checked.

IX. A *kindly disposition* to take fat on the most valuable parts of the carcass, at an early age, and with little food, when compared with the quantity and quality consumed by similar animals. On this account, smaller cattle have been recommended as generally having a more natural disposition to fatten, and as requiring, proportionably to the larger animal, less food to make them fat; consequently, the greater quantity of meat for consumption can be made per acre. "In stall-feeding,"—the nature, method, and advantages of which will be stated in a subsequent chapter,—it has been remarked, that, "whatever may be the food, the smaller animal pays most for that food; in dry lands, the smaller animal is always sufficiently heavy for treading; in wet lands less injurious."* But this opinion is combated by many able judges, who still contend that the largest animals are the most profitable. They doubtless are so on good keep; but the smaller animals will thrive on soils where heavy beasts will decline.

X. *Working*, or an aptitude for labor: a point of infinite importance in a country whose population is so extensive as that of Britain, and where the consumption of grain by horses has so material an influence on the comforts and existence of the inhabitants. As, however, there is a difference of opinion on this subject, the reader is referred to the chapter where the question is fully discussed. But, whether kine be purchased for the plough, or for the purpose of fattening, it will be necessary to see, in addition to the essentials already stated, that they are young, in perfect health, full-mouthed, and not broken either in tail, hair, or in any respect; that the hair stare not, and that they are not hide-bound, otherwise they will not feed kindly. The same remark is applicable to cows intended for the pail, the horns of which should be fair and smooth, the forehead broad and smooth, udders white, yet not fleshy, but thin and loose when empty, to hold the greater quantity of milk, but large when full; provided with large dug-veins to fill it, and with four elastic teats, in order that the milk may be more easily drawn off.

XI. Beside the rules above stated, there are some particulars with regard to the age of neat or black cattle and sheep, which merit the farmer's consideration.

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* It is stated in the Agricultural Survey of Leicestershire as the remark of a scientific observer of the cattle usually bred in that county, "that those of a deep red, dark liver color, or black, with tanned sides, are the hardiest, and have the best constitutions; will endure the severest weather, perform the most work, live to the greatest age, and fatten on such food as would starve those of weaker colors." But in opposition to this we have, in the Annals of Agriculture, the assurance of Mr. Campbell, a practical and extensive breeder, that, upon repeated comparative trials, "he has had bulls, oxen, and cows, of a white breed, as healthy and hardy as any others."

* Papers of the Bath and West of England Society, Vol. X, p. 262.

"Neat cattle cast no teeth until turned two years old, when they get two new teeth; at three they get two more; and in every succeeding year get two, until five years old, when they are called *full-mouthed*, though they are not properly full-mouthed until six years old, because the two corner teeth, which are last in renewing, are not perfectly up until they are six."*

The horns of neat cattle also supply another criterion by which the judgement may be assisted, after the signs afforded by the teeth become uncertain. When three years old, their horns are smooth and handsome; after which period there appears a circle, or wrinkle, which is annually increased as long as the horn remains; so that, according to the number of these circles or rings, the age of a beast may be ascertained with tolerable precision, unless such wrinkles are defaced, or artificially removed, by scraping or filing; a fraudulent practice, which is but too frequently adopted, in order to deceive the ignorant or inexperienced purchaser with respect to the real age of the animal. These circles, however, must not be confounded with those ringlets which are sometimes found at the root of the horn, and which are a pretty sure indication that the animal had been ill-fed during its growth: another common consequence of which is, that the horns are crooked and unsightly. There is also a tip at the extremity of the horn, which falls off about the third year.

The bull is termed a *bull calf* until he is one year old, and then a *yearling bull*, or, in some places, a *stirk*, and afterwards a two, three, four, and five years old bull, until six, when he is *aged*. When castrated, he is called an *ox*, or *stot-calf*, until a yearling, and then a *steer*, until four, when he becomes an *ox*, or *bullock*. The cow does not assume that name until four years old, previous to which she is called, first a cow-calf, and then a yearling, two, and three years old *heifer*, or *quey*.

Of the Bull.

In the preceding chapter, some general remarks on the purchasing of cattle have been made, and a few characteristic features have been pointed out, in order to assist the young adventurer in this branch of rural economy. But, as the *male* of every species is the principal in the breed and generation, it will not be useless to give an account of that form or shape which is so essential to the constituting of a perfect animal.

A bull, then, ought to be the most handsome of his kind; he should be tall and well made; his head should be rather long, but not coarse, as fineness of head indicates a disposition to fatten; and, as it is designed by nature to be the chief instrument both of offence and of defence, it ought to present every mark of strength;† his horns clean and bright; his large black eyes lively and protuberant: his forehead broad and close set, with short, curled hair; his ears long and thin, hairy within and without: muzzle fine; nostrils wide and open; neck strong and muscular, not incumbered with a coarse, wreathy skin, but firm, rising with a gentle curve from the shoulders, tapering to the part where it is connected with the head; dewlap thin, and but little loose skin on any part. His shoulders should be deep, high, and moderately broad at the top; the bosom open; breast large, and projecting well before his legs; back straight and broad, even to the setting on of the tail, which should not extend far up the roof, but be strong and deep, with much lank hair on the under part of it; ribs broad and circular, rising one above another, so that the last rib shall be rather the highest; the fore thighs strong and muscular, tapering gradually to the knees; the belly deep, straight, and also tapering a little to the hind thighs, which should be large and square; the roof wide, particularly over the chine and hips; or hooks; the legs straight, short jointed, full of sinews, clean and fine boned; knees round, big, and straight; feet distant one from another, not broad, nor turning in, but easily spreading; hoofs long and hollow; the hide not hard, or stubborn to the touch; the hair uniformly thick, short, curled, and of a soft texture; and the body long, deep, and round, filling well up to the shoulder end into the groin, so as to form what has not improperly been termed a round, or *barrel-like* carcass.

The bull attains the age of puberty generally at the end of from twelve months to two years; but it has been thought advisable to restrain him from the propagation of his species until he has arrived at his full growth, which is about four years; for, if this animal be suffered to breed earlier than three years, the stock is liable to degenerate. It must, however, be admitted, that a contrary opinion prevails among many eminent breeders; who maintain that the bull is in his full vigor at eighteen months old, at which age his progeny will display the most strength; and a prominent instance in point has been adduced in the practice of Mr. Vandergoes, of the Hague, who is reported to have had the finest stock of dairy cows in Holland, and who attributed the excellence of his breed to his using none but young bulls, which he always sold at three years of age. Others again contend, that the offspring of a bull, if well bred, becomes generally better until he reaches seven or eight years, and indeed, until his constitution is impaired by age.* Nor ought more than twenty cows to be allotted to one bull, or this animal be permitted to serve more than two cows in one day; for, although the cupidity of persons who hire out bulls, very generally exposes them to much greater trials of strength, it yet exhausts them, and they can no longer be depended upon as sure getters of stock; nor will the stock, if produced, be of equal vigor as when the number of cows is limited.

The bull, as well as the cow and ox, generally lives about fourteen years; but the progress of decay is usually perceptible after he has attained the age of ten. His temper is naturally fierce and ungovernable, which is not a little increased by his being usually permitted to live quietly in the best pastures, without being applied to any useful purpose but that of propagating his species. Hence this animal, naturally vicious, often becomes so mischievous as to endanger many valuable lives, an evil which, we conceive, might be remedied by

* Culley on Live Stock, pp. 208, 209.

† The Ayrshire dairy farmers, however, who pay very close attention to the perfection of their breed, prefer their dairy bulls according to the feminine aspect of their heads, necks, and fore-quarters; and wish them not round behind, but broad at the hook-bones and hips: they also like those best that are full in the flank.—Aiton's Dairy Husbandry, p. 27.

* See Sir John Sinclair's Code of Agriculture, 3d. Edition 1821, p. 108.

training him to labor; for, we doubt not but if he were moderately worked, and allowed to indulge his desires during the breeding season, he would become gradually tame, and harmless as the horse or any other often naturally vicious animal. Several experiments, indeed, have been made for this purpose; and, from their successful result, we think the practice of working bulls may be advantageously adopted; especially as these animals are not only broken in with little difficulty, and work well; but also because they recover from fatigue much sooner than the ox.

For the prevention of accidents from mischievous bulls, an ingenious and simple contrivance has been suggested by Mr. Nicholls, of Woodhall, near Wisbeach, on whom the Society for the Encouragement of Arts, in 1815, conferred a premium of ten guineas, for the invention. Of its form and application the following engravings will convey a correct idea.

Fig 1.

Fig. 2.

Fig. 1. Represents a *front* view of the apparatus, as affixed to the head of the animal. It consists of a straight piece of wood or iron (the latter is the preferable material) stretching from horn to horn, perforated at each end so as to pass over the tips, and fastened on them by the usual metal nuts. On the centre of this is riveted *a curved bar of iron*, bending upwards, which moves easily on the rivet, and has holes at each end containing the upper round link of a chain. These chains again unite in a strong iron ring, which opens by a hinge and screw, and passes through the bull's nose. The effect of this contrivance is as follows:—any person seeing a vicious animal approach may easily avoid him; but if the beast should make a push *forward*, the curved iron bar will prevent any bad consequences; and if he move in the smallest degree to the *right or to the left*, the bar communicating by the chain with the ring upon his nose, will bring him immediately to check. This *lateral* operation is delineated in Fig. 2. An additional advantage resulting from the use of this invention is, that a beast may, with the smallest power, be led in any direction.

Of the Cow.

A *perfect breeding cow* ought to have a fine head, with a broad, smooth forehead; black eyes; clean horns; a smooth, elastic skin; a large deep body; strong, muscular thighs; a large, white udder, with long and tapering teats, together with every other token requisite in a bull, allowing for the difference of sex, to which we may add, as a general remark, in the words of a skilful dairyman (although his observation was only applied to a particular breed) that, the symptoms of a good milker are "a large thin-skinned udder; large milk-veins; shallow and light fore-quarters; wide loins; a thin thigh; a white horn; a long thin head; a brisk and lively eye; fine and clean about the chaps and throat."* Further, such animal ought particularly to be young; for milch kine are not good for breeding after they are twelve years old, though they will often live a much longer time if their pasture be good, and they be kept from diseases.

Cows are purchased either with a view of being fattened for sale, for breeding, or for the purposes of the dairy. In the former case, it will be advisable to attend to the kindliness of their skins, and disposition to fatten; with regard to those which are intended for breeding, care should be taken to select the best of that particular stock intended to be raised; and for the dairy, those which yield the most, and the richest milk: a subject which will be treated more at large under that head.* The desirable qualities of a dairy cow are, that she should give an abundant supply of milk; fatten readily; and turn to good account in the shambles; but, in fact, those beasts which yield great quantities of milk, seldom fatten quickly, and repeated unsuccessful efforts to unite these two irreconcileable properties, have proved that the different breeds of neat cattle have not hitherto been brought to entire perfection. There is, it is true, a middling kind of cows, which give a tolerable quantity of milk, and also keep in pretty good condition; but, though many of this sort will become very fat when they are dried, or their milk is taken from them, yet they will not fatten so speedily or so well as those which yield a less portion of milk, and which are more kindly disposed to fatten while they are in a milking state.

As, however, the dairy constitutes, in many parts of the kingdom, an object of great importance, it is a point worthy of the most deliberate discussion, whether a particular breed ought to be kept for that purpose only, or whether it be preferable to have stock calculated partly for the butcher, and partly for the dairy. "It is probable," observes Sir John Sinclair,† "that, by great attention, a breed might be reared, the males of which might

* Wedge's Account of the Cheshire dairy breed.

* Book II.

† Hints regarding Cattle, inserted in the Farmers's Magazine, vol. iii, p. 156.

be well calculated, in every respect, for the shambles; and the females of which might, when young, produce abundant quantities of good milk; yet, when they reached eight or nine years of age, might be easily fattened. This," he justly remarks, "would be the most valuable breed that could be propagated in any country; and, indeed, some of the best English and Scottish breeds have almost reached that point of perfection." Nor would the attainment of that object be improbable, if more attention were paid to use bulls from the best fatting stock with the best milch cows.

The cow is supposed, by some eminent naturalists, to arrive at puberty at the end of eighteen months, though instances have occurred where these animals have produced calves before that time. It is, indeed, said by some breeders, in the northern part of this island, that young cows may be sent to the bull as early as even *one year* old; but there is then much danger in calving; and although the practice would certainly be an essential improvement where the dairy constitutes a primary object, provided their growth would not thus become stinted, it is yet generally considered injudicious. It besides often happens that when such young heifers fall in calf, they miss in the following year, and thus nothing is gained in stock, while to the animal itself, it is evidently injurious. It is, therefore, advisable not to permit cows to take the bull earlier than two years, though many breeders defer it another year; and, in conformity to the latter opinion, the late eminent Mr. Bakewell deferred sending his cows to bull till they were three years old; they, however, often missed calf, which accident Sir John Sinclair attributes to this circumstance. The most proper period must in some measure depend on the breed, on the time at which the heifer was herself dropped, and on her condition; as some which have been well kept will be more forward at two, than others, which have been stinted, at three years of age.

An idea formerly prevailed, and is not even yet entirely exploded, that the best mode of improving stock, of every description, was to choose males of the largest size. The consequences, however, have generally been a great increase of bone without any corresponding improvement in other qualities, and such an incongruity of shape as evidently denoted a mongrel breed. The most judicious method is, to employ males of superior shape but yet of a moderate size, and to couple them with females nearly as large, if not larger. The nearer the other qualities of both approach to perfection, of course the better will be their progeny; but it is material that, even in their best points, there should not be too great a disparity: gradual improvements will always be followed by certain ultimate success; while violent attempts to effect a sudden change generally disappoint expectation.

The most advantageous time, in general, for a cow to *take the bull* is, from the commencement of May till the middle or close of July, so that she may calve in January, and thence forward till March or April. And as it is, in most places, a matter of considerable importance to have a uniform supply of milk throughout the year, we conceive it would prove a source of profit to a farmer, possessing twelve, or any large number of milch kine, so to arrange the circumstance of breeding as to have three or more cows dry at one time.

The period of time during which cows are allowed to *run dry* previously to calving, is by no means settled. By some graziers they are recommended to be laid dry when they are about five or six months gone with calf; but repeated and successful experiments prove, that six weeks or two months are sufficient for this purpose; indeed, cows kept in good condition are sometimes drawn until within a fortnight of calving; but this is a practice not to be recommended; for if the cow *springs* before she is dry, serious injury may ensue.

The *symptoms of calving* are a distension, or springing, of the udder, and gradual yielding of the ligaments of the couples, or rump-bones, as well as an increased leanness between the shape and the udder, all of which are generally perceptible about a fortnight before the cow is at her full time; when that arrives it is marked, first, by a slight elevation of the tail, and then by general uneasiness until the pains commence.

In general, the cow *conceives* after once taking the bull; but, if she should chance to fail, she should go again to bull within three weeks after. To prevent, however, this accident, it will be advisable, as soon as convenient after her return home, to throw a pailful of water on her udder behind, and to keep her that night separate from any others: for it not unfrequently happens that cows (after taking the bull) will ride each other; in consequence of which they are apt to misconceive, and it is also supposed that, when they have acquired that habit, the quantity of milk they yield is thereby greatly diminished.

The desire of having a frequent supply of calves has induced many to have recourse to *artificial means*, in order to induce cows to take the bull; a measure which cannot be sufficiently deprecated, for the most efficacious mode of obtaining this object undoubtedly consists in keeping them in good heart; in consequence of which nature will predominate over the animal's body, and cause it to show signs of procreation through the medium of the creature's constitutional feelings. When it has been resorted to, one of the most effectual means has been found to give a couple of quarts of milk, warm from a cow in season, but before she has taken the bull, and in a few days it has taken effect. The time when a *cow is in season*, is known by her restlessness, by her riding on other cattle; and by the inflamed appearance of the external parts, accompanied by a discharge from the vagina. These symptoms only continue for three or four days, sometimes not so long, and do not return for a fortnight or three weeks; and when conception has taken place they disappear.

The *period of gestation*, or time during which the cow goes with calf is various: with a bull calf, she usually goes about forty-one weeks, with a difference of a few days either way; a cow calf comes in less time. Between nine and ten months, therefore, may be assigned for the period of gestation; at the end of which time she produces one calf; though instances sometimes occur when two, or even three, are brought forth. It may not however be useless to remark, that some cows are naturally *barren*, which is said to be the case when a male and female calf are produced at the same time. The male animal is perfect in all respects; but the female, which is denominated a *free martin*, is incapable of propagating her species; it does not vary very materially, in point of form or size, from other neat cattle, though its flesh is errone-

ously supposed to be greatly superior in flavor and fineness of the grain.

Some very interesting experiments, respecting the periods of gestation in different animals, were made a few years ago by M. Teissier, of the Society for the Encouragement of Arts, at Paris; from which it appears, that out of 575 cows,

21 calved between the 240th and 270th day; mean term 259½

544	270th	299th	282
10	299th	321st	303

Thus, between the shortest and the longest gestation there was a difference of eighty-one days, which is more than one fourth of the mean duration.

As cows are very subject to *abortion*, when improperly treated during gestation, they ought to be observed with more than ordinary care through the whole of that period, lest they should leap ditches, &c., and on no account should they be suffered to draw in the plough or other carriage, which is the practice in some countries. For about a month or six weeks before the time of calving, it will be advisable to turn the cow to grass, if in the spring; but if it happen in the winter, she should be fed with the best hay, and some turnips, potatoes, carrots, or other winter fodder, or with a mixture of bran and oat or bean meal, to which grains may sometimes be added; or, should these not be at hand, the mere boiling of a portion of the hay, and giving it along with the water, when cool, will be found to keep her body in a healthful state for calving, and also to improve her milk. It is not proper that she should be made fat, because the fatter a cow is, the less milk is given; and yet, if she be too poor, there is danger lest she should fall in calving.

When the term of gestation is nearly complete, the animal should be kept apart from other cattle, in a quiet close, near the homestead, in order that she should be under constant observation, and that assistance may be ready in case of a difficult birth; and, as the final period approaches, attention should be paid to keep her bowels open, by means of laxative drinks. If the cow should be so much exhausted in calving, as that the throes are not sufficient to produce the birth, she should occasionally have a drink of two or three quarts of gruel, and a pint of ale, which will give her strength to make further efforts to get rid of the calf, and will also assist the operation. Cows sometimes calve in a recumbent posture, and care should be taken that the place where they lie down is not on a steep descent; for in that case, the calf is apt to be brought prematurely forward, and, by the straining and irritation it produces, a tedious, and sometimes dangerous calving is occasioned. But, on the contrary, when the act of calving has actually commenced, the operation is aided by the animal being laid on a descent.

The day and night after a cow has calved, she is usually kept in the house, and allowed tepid or lukewarm water only for her drink. The propriety of this practice has, however, been questioned, and some eminent breeders are of opinion that housing, unless in very chill, or wet weather, is unnecessary; and that cold water is better than warm. On this we may observe, that the more nature is left to direct her own operations, the better; yet there can be no doubt that, in particular instances, she may be aided not only without injury, but with advantage: perhaps, therefore, in very fine weather, all that may be necessary will be to watch the cow attentively, lest she should require aid, but not to use any artificial means unless she may evidently need assistance. In cold weather, there can be little doubt that it is most advisable to house her, and not only to take the chill off the water, but to allow her some gruel. On the day following she may be turned out about noon, and be regularly taken in during the night, for three or four successive days. The animals thus housed should be kept till the morning cold is dispersed, previously to their being turned into the field, otherwise a premature exposure to the damp atmosphere cannot fail of greatly weakening them.

The hints above stated are given on the supposition that the cow is well, no difficulty having happened during the time of calving; and that she has not *slipped*, or *cast her calf* before its full time. It should be observed, that the proper position of a calf, while in the uterus, is with its fore-feet and head foremost, its back being towards the cow's back, and its two fore-feet lying parallel to the sides of its head. When the fœtus appears in any other manner, it is termed an *unnatural position;* and the extraction of the calf, under these circumstances, requires the utmost steadiness and dexterity; as, however, no instructions can be adequate to every possible case, it will always be necessary where this event is apprehended, immediately to apply to some expert cow doctor, lest the loss of a valuable animal should be the consequence of injudicious treatment. During this painful operation, particular attention should be given that the pudendum, or *baron*, as it is sometimes called, be not lacerated or torn; should this, however, take place, the part must be sewed gently up; and, if it be swollen, it ought to be washed with lukewarm milk and water.

But, where a cow slip, or casts her calf prematurely, she must be tended with great care; and, whatever may be the cause, whether abusive treatment, violent exercise, bruises or blows, or that unnatural appetite known by the name of *longing*, every animal that has slipped her calf should be carefully separated from the rest of the herd.* Cleanliness, which is an essential requisite in the general management of cattle, ought in this instance to be an object of special attention; and, as cows which are liable to drop their calves usually evince some preparatory symptoms between the cause of the abortion and the actual slipping of the fœtus, it will not be altogether useless to bleed them two or three times, as this expedient has sometimes operated as a preventive.

After, however, the calf is produced, it will be necessary to assist the natural functions of the ani-

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* This latter direction should be scrupulously attended to; for, however extraordinary it may appear, repeated experience has proved that the disease is infectious. Various reasons have been assigned, but none satisfactorily account for it; though it appears to be occasioned by some peculiar odor issuing from cows which are thus affected: the fact, however, having been ascertained, should be guarded against. It is also worthy of remark, that cows which have once slipped a calf are more liable than others to a recurrence of miscarriage.

mal, in order to carry off the *secundines*,* provided in the uterus for nourishing the fœtus; and which, continuing there, in consequence of abortion, would become putrescent, and thus occasion a disagreeable odor that would quickly communicate an infection among other breeding cows. For this purpose we would, at all times, recommend the following mixture to be given to the cow, as soon after calving as possible: let about three quarts of water simmer over the fire; and, when warm, strew in as much oatmeal as will be sufficient to make a strong gruel, carefully stirring the whole till it boils, that no lumps may arise; then add one quart of ale (or two of table beer) and one pound of treacle, and carefully incorporate the different ingredients by stirring. This mixture should be given lukewarm: it is peculiarly grateful to cows, which will drink it eagerly, after the first hornful, and are thus prevented from taking cold; and, as it is of importance to regulate the state of the body, this object may be effected by giving a warm bran mash; but this treatment only applies to animals that are housed.

It will be necessary to milk the cows, especially if they be full of flesh and the udder hard, three or four times a day, for two or three days, and the calf should be suffered to suck as frequently, if in the house; or, in the field, to run with her, and suck at pleasure; care being taken to observe that the mother does not prevent it; for, if the udder or teats be sore, she will naturally be averse to suckling, and danger is incurred of losing both animals: and, in case the kernel of the udder is hard, the hardness may be removed by rubbing it three or four times in the day.

The falling down of the calf-bed is a serious accident, which sometimes occurs after a laborious birth, when the cow is more than usually fatigued, although some beasts are naturally disposed to such weakness. Where the falling down of the calf-bed is apprehended, the cow ought to be carefully watched; and the placenta, or cleansing, should be removed, if possible, without effusion of blood; after which the operator may gently replace the calf-bed, taking care not to withdraw his hand till the former begins to feel warm. The following draught may then be given: let bay-berries, pulverized gentian root, and coriander seeds, of each one ounce; aniseeds and juniper berries, of each two ounces; and half a pound of treacle, be given in three pints of good strong beer; after which lead the cow gently down a hill, if there be one adjacent, as the motion will greatly contribute to replacing the calf-bed in its proper position, and render the application of stays to the womb unnecessary. Where beasts have a peculiar construction, favoring this malady, it may possibly be prevented when the period of gestation is nearly expired, by extending their stalls so as to favor their lying down; but where the calf-bed comes down, and no immediate aid can be procured, it should be deposited on and covered with a clean linen sheet; the irritation thereby produced being considerably less than that of the air, litter, &c.; and when it is replaced, those parts which have been so exposed should be bathed with new milk and brandy, rum, or spirit of wine, after which the treatment above mentioned may be pursued.

After calving, the cow should not be permitted to take the bull until four or five weeks have elapsed, although she should show symptoms of coition sooner—as the womb is before that time in so relaxed a state as seldom to admit of conception.*

[To be continued.]

* Or afterbirth, sometimes termed the cleansing. Cows will often eat this excrement with avidity; and to prevent that, it is generally removed: but it is to be doubted whether this practice is judicious, for nature seems to have provided this substance as a medicine for the animal, which may be requisite at the time, and its being eaten is never known to be prejudicial to its health.

CULTIVATION OF THE UNITED KINGDOM.

From the Quarterly Journal of Agriculture.

The following statement will be found interesting, as exhibiting the number of acres in cultivation in the United Kingdom, and the different purposes specified, for which there are employed in England and Wales; as well as the number of farms, and the annual amount of property derived from agriculture:

	Cultivated Acres.	Uncultivated wastes incapable of improvement.	Barren and unprofitable.	Total.
England	25,632,000	3,454,000	3,256,400	32,342,400
Wales	3,117,000	530,000	1,105,000	4,752,000
Scotland	5,265,000	5,950,000	8,523,930	19,738,930
Ireland	12,525,280	4,500,000	2,416,664	19,441,944
British Isles,	383,690	166,000	569,469	1,119,159
Total	46,922,970	14,600,000	15,871,463	77,394,433

The number of farms in the United Kingdom is estimated at 2,000,000 and the property annually derived from agriculture in Great Britain and Ireland at £215,817,624.

In England and Wales it is calculated that there are—

3,250,000	Acres employed in the cultivation of	Wheat.
1,250,000		Barley and Rye.
3,200,000		Oats, Beans, and Peas.
1,200,000		Clover, Rye, Grass, &c.
1,200,000		Roots and Cabbages by the plough
2,100,000	Acres of	Fallows,
47,000	. .	of Hop Grounds.
18,000	. .	of Pleasure Grounds
17,300,000	. .	depastured by Cattle.
1,200,000	. .	of Hedge Rows, Copses, and Woods.
1,300,000	. .	of Ways and Water-Courses.
5,029,000	. .	Common and Waste Lands.
37,094,000	Acres.—Total of England and Wales.	

Consumption of wheat and other grain in the United Kingdom, in a year, six months, a month, a week, &c.

	Wheat, Quarters.	Other Grain, Quarters.	Total Quarters.
A year - -	12,000,000	40,000,000	52,000,000
Six months -	6,000,000	20,000,000	26,000,000
Three months -	3,000,000	10,000,000	13,000,000
Six weeks - - -	1,500,000	5,000,000	6,500,000
One month - - -	1,000,000	3,333,333	4,333,333
Two weeks - - -	500,000	1,666,666	2,166,666
One week - - -	250,000	833,333	1,083,333
One day - - - - -	35,714	119,048	154,762

* See Skellett on the Parturition of the Cow; which contains much valuable information on the subject of difficult births.

CLIMATE OF VIRGINIA.

To the Editor of the Farmers' Register.

Braynefield, Caroline co. Va. July 8, 1834.

Revolution has not been confined alone to man. Nature is deeply marked with the footsteps of its caprice. The sea now murmurs over the ruins of imperial Carthage—islands spring into life from the bosom of the ocean—the relics of a gigantic race both in the moral and physical world are wide scattered over the hills and valleys of our western country, and though we believe the world to be old, it has existed but as a day in the march of nature, and we but as the restless pilgrims of an hour. Philosophy may tremble at the grandeur of the scene, while wisdom is left to gather light from the feeble glimmerings of its own brief experience.

All climates have felt the power of this controlling agent, and from a series of latent and visible causes, most of them have become radically changed. In the annals of that clime of the vine and the olive, Palestine, we have the testimony of holy writ to prove the severity of its winters—

"The waters are hid as with a stone, and the face of the deep is frozen." Job xxxviii. 30.

"He giveth snow like wool. He scattereth the hoar frost like ashes. He casteth forth his ice like morsels. Who can stand before his cold?" Psalms cxlvii. 16, 17.

The cloudless sky of Italy owes most of its boasted glory to the favoring influence of this change. In the Georgics of Virgil we find the young husbandman advised to protect his stock from the injurious effects of ice and from "*glaciem ventosque nivales*," while Horace often writes like a sea-coal poet, borrowing his inspiration from a cheerful fire, and his boldest metaphors from the terrors of winter. Cæsar* and Juvenal frequently allude to the existence of severe cold; and Ovid in his unmanly wailings from the shores of the Euxine, tells us that oxen and carriages passed over that sea on the ice—that wine was presented to him congealed, and that the snows of winter were not dissolved until the ensuing summer. The countries of Europe and Asia whose history is familiar to us from the recollections of youthful study, are all characterized by the same gradual amelioration of climate, and we may safely assert that every extension of agricultural improvement produces a gradual decrease of cold, of half of a degree to each progressive century. From the philosophical tables of Kirwan, it will appear that the several places in Europe at which his observations were made, possess twelve degrees more of heat, than American provinces lying in the same parallel of latitude. This result cannot be sustained by a comparison drawn from the earlier days of Europe, and we may fairly conclude that the increase of population in that country, and its exchange from the pursuits of hunting and feudal war, to the clearing of forests, and the improvement of land, in giving to the earth a greater facility to retain heat, has produced a corresponding mildness of temperature.

* In the time of Cæsar the reindeer, elk, and wild bull were natives of the Hercynian forest, which overshadowed a great part of Germany and Poland. The two former are now found only in extreme northern latitudes.

At the discovery of our continent it presented an immense forest untouched by human labor. The majestic rivers of the new world, swelling by every shower, inundated the whole country, and left in their track numerous marshes and extensive lakes. The woods were hid with rank luxuriance, while the exuberant undergrowth of herbs, shrubs, and weeds, gave to the prospect that gloomy and repulsive solitude which was so aptly described by the first settlers as *the wilderness*. The earth could not retain the heat of the sun, nor could this effect be produced by the mass of foliage. The air stagnated in the forest. Offensive exhalations arose from the numerous marshes, and the accumulated decay of vegetation, while the whole land was rife with the pestilence of malaria.

We cannot always arrive at definite conclusions of the climate of any country by barely measuring its degrees of distance from the equator. Its character is controlled by many other direct causes. Extent of territory—nature of soil—height of mountains and elevation above the sea, greatly affect it. The extent of our northern seas, with the ice which continues there from year to year, gives to every wind which blows over them an intense cold. A chain of gigantic mountains spread their snow-capped summits throughout the heart of our continent. The winds which blow over them become deeply surcharged with cold, whose piercing severity is not diminished until it has extended far down upon our southern sea coast. Our daily experience attests the truth of this fact, for who in Virginia has not been chilled by the duration of a north west wind, or even its sudden shifting to that point?

The climate of Virginia has not been stationary in this revolution of nature, but has rapidly advanced in the van of its progress. To trace its characteristics is to follow the varying passions of the coquette—now enticing by seductive smiles—and now chilling by capricious frowns. Yet it is the clime under whose genial influence we have been bred, and we can easily forget its vicissitudes in the glittering canopy of life and beauty which it throws around every scene. Those who have dwelt amid the sunny clime of Italy—the fierce heat of Spain, and the elastic air of France, can appreciate from the test of comparison, the softness of a Virginian day—and how splenetic soever we may be, it never has gloom enough to make us "damn it as a lord."

Captain John Smith in his faithful and spirited History of the Colony of Virginia, makes many allusions to its climate, and with a proper allowance for his zeal in coloring the advantages of a settlement in the colony, we may receive his statements as the honest opinions of a careful and accurate observer.

"The sommer (says he) is hot as in Spaine, the winter cold as in France or England. The heate of sommer is in June, July, and August, but commonly the cool breezes asswage the vehemency of the heate. The chief of the winter is halfe December, January, February, and halfe March. The cold is extreme sharpe, but here the proverbe is true "that no extreme long continueth.* Sometimes there are great droughts, other times much raine, yet greater necessitie of neither, by reason we see not but that all the raritie of needful fruites in Europe may be there in great plentie by the

Smith's History of Virginia, Vol. I. 113.

industrie of man."* In an earnest appeal to the friends of the colony, he again recommends it for the "mildnesse of the ayre and the fertilitie of the soyle."†

This sketch of the colony is studiously silent as to the existence of marshes, though much of the ill health of the first emigrants, may be traced to them.‡ In giving an account of the bays, rivers, and brooks, our author incidentally remarks that "by the rivers are many plaine marishes containing some twenty, some one hundred and some two hundred acres. But little of grasse there is but what groweth in low marishes:"‖ In the advance of population and agricultural improvement, these marshes were gradually reduced. Mr. Nathaniel Caussey who had lived in Virginia with Capt. Smith, states in the year 1627, "that whereas the country was heretofore helt most intemperate and contagious by many now they have houses lodging and victuals and the sun hath power to exhale up the moist vapours of the earth where they have cut down the woods, which before it could not, being covered with spreading tops of high trees, they find it much more healthful than before."¶ Captain Butler a gallant pioneer of the new world, and at one time governor of Bermuda, on his return to England from Virginia in the year 1624, presented to Charles I. a pamphlet entitled, "*The unmasked face of our colony in Virginia as it was in the winter* 1622."§ In this work he draws a lamentable picture of the struggles of the infant colony, and asserts "that the English plantations are generally seated on marshes, lakes, and infectious bogs which have subjected the planters to the inconveniences and diseases prevalent in the most unhealthy parts of England."** This pamphlet excited much hostility against the Virginian Company, which was artfully fermented by Charles I. who was then secretly planning the ruin of that noble and patriotic association. Some of the members of the company who had been in Virginia united in an address to the public, in which they state "that they had found the air of Virginia to be as wholesome and the soil for the most part as fertile as in any part of England."†† The House of Burgesses in a curious memorial of resentment, ill humor, and personal sarcasm, pronounced the charges of Capt. Butler to be false and slanderous, and informed the king "that no bogs have been seen here, by any that have lived here twice as many years as Capt. Butler did weeks in the country—the places which he so miscalls being the richest parts of the earth, if we had a sufficient force to clear their woods and to give the fresh springs which pass through them a free passage. The soil is generally rich and restores our trust with abundance. The air is sweete and the clime healthful, all circumstances considered, to men of sound bodies and good government."‡‡

In 1624 the Virginian Company in petitioning parliament for encouragement and protection, earnestly recommended the colony "for that temperature of climate which agreed well with the English."* Smith often makes similar comparisons, and it is evident from the writings of our earliest historians, that the climate of Virginia differed but little from that of England. The immense mass of vegetation which overshadowed the country, filled it with fogs and vapors, assimilating it to that of England, and rendering it extremely cold in its winters, and tardy in its summers. It was less affected by the standard temperature of the sea than England, and was marked with more striking vicissitudes. The cold winter of 1607, which was felt throughout all Europe† was, in the language of Smith, found "as extreame in Virginia." There were also many unseasonable years, and others singularly propitious to the agriculture of the country. The year 1610 was long recollected by the epithet of *the starving* time, while in the year 1619 two crops of rare ripe corn were made.‡ Among many of the acts of the House of Burgesses regulating the trade of the country, we find one which prohibits the exportation of Indian corn, "on account of the unseasonableness of the last two summers."§

As the country was gradually cleared of its forests and undergrowth, the climate became dry, temperate, and warm. The act of the House of Burgesses of 1705, which directed the capitol to be built at Williamsburg recites, "that this place hath been found by constant experience to be healthy and agreeable to the constitutions of this his majesty's colony and dominion, having the natural advantages of a serene and temperate air, and dry and champaign land."¶ A correspondent to the Royal Philosophical Society, who wrote an account of Virginia about this period, says "that the winters are dry and clear—the spring is earlier than that of England. Snow falls in great quantities, but seldom lies above a day or two, and the frosts, though quick and sharpe, seldom last long. July and August are sultry hot, while September is noted for prodigious showers of rain. The north and north west winds are either very sharp and piercing, or boisterous and stormy, and the south east and south hazy and sultry."

From the want of accurate observations, and those careful collections of meteorological facts which elucidate the character of all climates, our speculations on that of Virginia must be necessarily vague and indefinite, and for the nicer shades of its changes, we are forced to substitute the broader features of its outline. Our climate is uniform only in its sudden vicissitudes. Its consistency is impaired by many causes, which have produced a difference of temperature dependant on the deeply marked geographical distinctions of our sea board, tide water, valley, and mountainous regions. My observations have been principally confined to that intermediate country, between the Chesapeake and the South West Mountains, on the low and moist lands of the Mataponi, in latitude north 38° 6′, and about seventy miles south of Washington City. While I am forced in my

* Same, 114. † Same, 128.

‡ In the reply of Gov. Berkeley to the enquiries of the Lords Commissioners of Foreign Plantations, in 1671, he states "that all *new plantations* are for an age or two unhealthy, until they are thoroughly cleared of wood." 2 Hen. Stat. at Large, 515.

‖ Smith's History of Virginia, Vol. II. 115, 121.

¶ Same, 258.

§ Stith calls it a "starch and affected title."

** Stith's History of Virginia, 278. †† Same, 291.

‡‡ Stith, 308.

* Stith, 325.

† In this year at Paris the beard of Henry IV. was frozen in bed *cum regina*. Sully's Mem. Vol. IV. 262.

‡ Stith, 162. § Hen. Stat. Large, Vol. III. 185.

¶ Hen. Stat. at Large, Vol. III. 410.

examination of the temperature of the other parts of the state, to rely on statements often inaccurate in their conception and irrelevant in their details.

The standard temperature of every country is regulated by that of the level of the ocean. According to the researches of Professor Leslie, the mean temperature at the level of the sea, in our latitude is between 67° and 71° degrees, which gradually diminishes from that level, until it reaches the point of perpetual congelation. Pure air is not heated by the sun's rays which pass through it; the solar rays must be stopped by the earth, collected and reflected before any heat can be given to the atmosphere. In taking a standard, we assume the sea, which affords a fairer criterion of uniform temperature, than the mean heat of springs and wells. Neither does the sea retain the extreme of heat or cold which we find in the earth. A cold wind blowing over this volume of salt water, necessarily cools its surface, which from its increase of specific gravity, sinks and gives place to an inferior warmer wave. The action of the wind in rippling the surface of the water, and the influence of tide and currents conspire in bringing the warmer water to the level of the sea to mitigate the coldness of the wind: this action continues till the whole water is so far cooled that it becomes susceptible of frost. When frozen it is no longer warmed from the inferior water, but blows on with increased rigor. A warm wind takes a portion of cold as it passes over the surface of the sea, and becomes reduced to the mean temperature of that body. The sea breeze so prevalent in Eastern Virginia is cool as much from the standard heat of the ocean, as from its rapidity of motion: it is cooler in Virginia than in the West Indies, and often since the opening of the country, spreads its elastic freshness to the foot of the South West Mountains. There is a sensible and striking difference between the temperature of Eastern and Western Virginia. The former from its vicinity to the sea coast, becomes tempered into more gentleness; while its earlier vegetation shows the greater power of its soil to retain heat. In the latter, the winters are longer and more severe, yet the farmer may there admire the wisdom of that providence, which in increasing the rigor of the frost, mellows and crumbles the land for the purposes of agriculture, while the light soils of the east require no such agency.

In the course of five years, from 1772 to 1777, Mr. Jefferson made many observations on the temperature at Williamsburg, and having reduced them to an average for each month in the year, he has given us the results of the greatest daily heat of the several seasons.* I have before me a series of careful observations compiled by that accurate thinker, and accomplished scholar, the late David Watson, (of Louisa County) in a similar period of five years, from 1823 to 1828. His residence was near the South West Mountains, and in a country comparatively thickly covered with wood. The result of his observations and those of Mr. Jeffersons, making a distance in time of 52 years, and of southern latitude in favor of Williamsburg, is here submitted.

	Mr. Jefferson's.		
January,	38½°	to	44°
February,	41	to	47½
March,	48	to	54½
April,	56	to	62½
May,	63	to	70½
June,	71½	to	78¼
July,	77	to	82½
August,	76¼	to	81
September,	69½	to	74¼
October,	61¼	to	66½
November,	47¾	to	53½
December,	43	to	48¾
	Mr. Watson's.		
January,	36	to	44
February,	35	to	40
March,	44	to	49
April,	56	to	60
May,	61	to	69
June,	71	to	79
July,	80	to	84
August,	81	to	84
September,	74	to	77
October,	59	to	63
November,	46	to	54
December,	40	to	44

The coolest and warmest parts of the day were separately added, and an average of the greatest cold and heat of that day was formed. From the averages of every day in the month, a general average for the whole month was deduced. In following this mode of analysis, there are many slight features of discrepancy between the statements of Mr. Jefferson and Mr. Watson, which considerably impair the correctness of the comparison. Mr. Watson's thermometer was suspended in a passage, far removed from the action of fire, in a house constructed of wood; and the calculation of his table is based on observations made between the hours of 10 A. M. and 3 P. M. Mr. Jefferson is silent as to the *situation* of his thermometer, while it appears that he has reckoned from the hours of 8 A. M. to 4 P. M.

The hottest period of these five years, observed by Mr. Watson, was in July 1825, when the thermometer on several days rose above 90°, and the hottest month was in August 1828. The coldest period was during the month of January 1827, and the warmest winter was in 1828—29.

My own observations made during a period of four years, from 1829 to 1834, cannot be calculated for an average temperature. Many days and even months from my absence from home, were necessarily unnoticed. Those periods which are recorded differ but little in their particular and daily results, from those of Mr. Watson; while I have noticed his singular omission—the prevalence of the winds, and the "fantastic tricks" with which our climate so playfully disports. From my observations, I am induced to place the mean temperature of our climate at 55°; thus varying according to natural and artificial causes several degrees from the standard temperature of the sea.

The year 1831 was characterised by many vicissitudes of heat and cold. On the 27th February the mercury sunk to 7°, while in July and August it frequently rose to 86° and 94°. The ensuing winters of 1831 and 1832 was uncommonly rigorous, snow fell in great quantities, and in many

* Notes on Virginia, Query 8.

places continued on the ground till the 4th of March. Early frost did much injury to vegetation, while the cold was but slightly removed from the earth until late in the ensuing summer. The spring of 1834 was attended by severe frosts, which resembled in their destructive character, those which had rendered the year 1816 proverbial. They committed great devastations in April, and on the 15th, 16th, and 17th of May, the Indian corn on our low lands, and the leaves of the garden and forest trees were scathed and blighted to a degree precluding, in many cases, all hope of restoration.

In Virginia the transitions from heat to cold are sudden, and sometimes to very extreme degrees; often in the day time the mercury will stand at 94° or 81°, and will fall in the course of a few hours to 60° and 50°. Mr. Jefferson informs us that the mercury has been known to descend from 92° to 47° in thirteen hours. I have frequently noted vicissitudes of a similar kind, and when the change is accompanied by a south east wind and rain, the air becomes cold, raw and disagreeable. We have few summers in which a fire is not often required. On the 1st of May, 1827, there was a slight fall of snow at Gloucester Court House,* while it is not uncommon to see slight frosts in August. In our winter the cold weather, though severe is short, and the frequent snows of the night are generally removed before the sunset of the ensuing day. Water in ponds is slowly congealed, and rarely makes ice thick enough for preservation, until it has been chilled by a fall of snow—again, its production is very rapid; rivers half of a mile in breadth, will be frozen over in the course of one night, sufficiently firm to bear men and horses.† In the month of January, 1827, many of those short yet wide salt streams, which wash the shores of Gloucester county, were frozen to the extent of thirty or forty feet from the land. This rigorous cold is rarely of much duration, sustained, and principally created by north and north eastern winds, it quickly yields to the shifting of the wind to any other point. Some of our winters are so temperate and mild, that the cattle can find a support in the woods; vegetation has been observed in all the winter months, and in the latter part of December diminutive pears, peaches and apples, fully ripened, have been gathered from the trees. A rose exposed in an open garden bloomed throughout the whole winter of '28 and '29; in this winter the peach tree bloomed in the latter part of January, and produced in its regular season a plentiful crop of fruit. Many of our coldest days are succeeded by gentle and moderate evenings; our severest cold is about the latter part of January, generally commencing after a hard rain, and continuing on an average about six days, thus realising the truth of that old Virginian proverb, "that as the day lengthens the cold strengthens;" a rapid thaw, often accompanied with rain and east winds, then takes place, while warm days and moderate nights soon reduce its severity, and open the way for the premature approach of spring. "Halfe of March" is no longer winter, spring has already scattered her vivid mantle o'er the scene, while the whole air is redolent of life and fragrance. Yet even its brightness is momentary—an unexpected frost often shows that the frown of winter still lingers on the land, and we too frequently find a practical illustration of Shakespear's metaphor,

> "The tyrannous breathings of the north,
> Checks all our buds from blowing."

It is now stormy, variable and cold; now calm, gentle and warm, and now dry, peaceful, and serene. Until the middle of May our climate presents one incessant tumult of rain and drought, frost and heat; yet a spring uniformly cold is far more favorable to our agriculture, than its usual uncertain temperature for suppressing vegetation, it protects it from the blighting frosts of March and April. Often during the spring months the weather is excessively damp, cloudy and hazy; in March, 1833, the sun was obscured for more than thirteen days, while every thing was chilled into gloomy melancholy.

The vegetation of this season affords us a criterion of the heat of the spring, which may be received in aid of the more accurate results derived from the thermometer. In the course of four years I have found these average periods of time sustained by careful observations:

Peach blooms from March 7 to March 14.
Apple blooms from March 20 to March 29.
Cherry blooms from March 13 to March 17.
Plum blooms from March 26 to March 31.
Strawberry blooms from March 24 to March 31.*

About the latter part of May our summer has commenced: the air becomes dry, warm and elastic, and the verdure of the forest assumes a more deepened hue of vivid green. The superabundant moisture of the earth acquired during the winter, is now thoroughly evaporated, and the temperature of the season in dispelling lassitude, invigorates into activity; summer burns on with a bright and glowing splendor, alternately relieved by gentle showers and refreshing breezes. Occasional droughts of many weeks in duration, parch the luxuriance of the vegetation; they are succeeded by copious and heavy showers of rain, which quickly restore the withered prospect. The approach of autumn is marked by heavy fogs in the morning and evening, which are soon dispelled, leaving that calm and serene temperature, which gives to this season all the beauty of tranquil repose. In every season there is a large and constant exhalation from the earth in the shape of vapor, its volume being proportioned to the heat of the day. We do not often observe this exhalation when the heat of the atmosphere differs in a small degree from that of the earth; when the temperature of the air is considerably lower, this vapor so soon as it has arisen is deprived of a part of its heat, while its watery particles are more

* Dr. Rush in his essay on the climate of Pennsylvania, mentions a fall of snow at Philadelphia on the night between the 4th and 5th May, 1774.

† Mr. Jefferson tells us that in 1776 York River was frozen over at York town, and in 1780, Chesapeake Bay was solid from its head to the mouth of the Potomac. The cold winters of 1784 and 1814 still live in the recollections of tradition.

* At the residence of R. G. Esq. near the Natural Bridge in the Valley of Virginia, these fruit trees in the year 1834, bloomed at the following periods:—

Peach	April 1.
Apple	March 30.
Plum	April 1.
Strawberry	April 15.

closely attracted into union and become visible in the shape of fog. In the autumn of Virginia, the heat of the day is sufficient to produce a large ascent of vapor. Undisturbed by currents of wind it easily condenses, and is thickened by calm and chilling nights into a heavy mist, which in the guise of a cloud finds its resting place on the earth. Autumn of all other seasons, is least liable to sudden and extreme vicissitudes. The approach of winter is alike gradual and uniform, and though we have frequent light snows, its mildness is rarely wasted away until late in December.

In reasoning from the researches of philosophy, we are taught to place but little reliance on the uncertain narratives of tradition; they, however, with a slow yet steady advance, acquire respect, and (often) mould theory into fact, and fashion opinion into fixed principles. The common belief that our climate has been changed into a milder temperature, has taken most of its certainty from the statements of our old people, who are uniformly consistent in this particular. The bloom of the orchard trees formerly restrained by a protracted winter from premature expansion, rarely failed arriving at the maturity of fruit; the earth remained covered with snow for many weeks, and the winter did not, as now, dally with the wantonness of spring. The marshes, uncleared lands, ponds and lakes, which conspired to absorb the heat of the earth,* have been almost obliterated or greatly reduced. There is a lesser quantity of snow, and more of rain, while the frequency of violent storms of wind in the spring and summer, distinctly prove the great mass of our local heat, and accumulated electricity.

The winds of Virginia are singularly fickle and capricious, possessing neither the uniformity or regularity of those which blow at the tropics. Our prevailing wind is the south west, which assumes, alternately, gentle and severe characteristics. The frequency of south western winds above the latitudes of the trades, flows as a necessary consequence, from the continuance and direction of the vast current of air. It moves unconfined and unresisted over the sea, until it reaches that unbroken range of mountains, which towers from one extremity of our continent to the other. It strikes against them, and from its elasticity rebounds with great velocity, in a direction opposed to the forcing powers of the trades, taking in its oblique movement all those features which mark our south western wind.

During the spring the north east is the most common wind. The huge masses of snow and ice at the north pole, are gradually melted by the heat of the sun; great quantities of vapor during this time are exhaled and remain suspended, augmenting both the weight and bulk of the atmosphere. That wonderful and mysterious agent, *electricity*, in dispelling the vapor and converting it into elastic air,† gives an impetus to that wind which issuing from the poles, takes a north eastern direction as it advances southerly, (its diurnal motion being less than that of the earth,) and falls surcharged with snow and rain on every portion of our country.

Mr. Jefferson made 3698 observations on the various points from which our winds blew, noting their changes two or three times in each day. The prevalence of the south west winds, over those from other quarters is thus numerically stated by him:

South west,	926.	North,	409.
North,	611.	West,	351.
North east,	548.	South east,	223.
East,	521.	South,	109.

He has also made a comparative view of the difference between the winds at Monticello and Williamsburg. He has reduced nine months' observations at Monticello, to four principal points, being perpendicular to, or parallel with, our coasts, mountains, and rivers, viz: the north east, south east, south west, and north west. He has also reduced an equal number of observations, 421, from his table above, taking them *proportionally* from every point.

My own observations made many times in each day, amount to 749, without reducing them in the proportionate manner of Mr. Jefferson. I have submitted them under the points and heads which he has adopted:

	N. E.	S. E.	S. W.	N. W.	Total.
Williamsburg,	127	61	132	101	421
Monticello,	32	91	126	172	421
Braynefield,	204	130	247	168	—749

In an average of two years, I have found our winds thus yearly prevailing; the dominant wind of each day being only reckoned, and not the usual vicissitudes of local breezes, or squalls.

	Days.		Days.
South west,	122	East,	30
North west,	89	North,	26
North east,	61	South,	21
		West,	12
	272	South east,	4
			93
			272
			365 days.

A curious phenomenon is sometimes witnessed during a severe wind from the south west; a thin vapor or scud is seen moving with great velocity below the clouds, from the north east, there being two currents of air of directly contrary courses in active motion at the same time.

In the early part of the spring and autumn, in dry seasons, about sunset, it is common to meet with currents of warm air, small in their extent yet extremely rapid in their movements; they are considerably above the heat of the human body, and are wayward and eccentric, both in their du-

* This principle is apparent from the fact that marshy countries are always cold; the decrease of temperature after a violent rain, also proves its truth. An unusual evaporation carries off the heat of the earth, and may we not reasonably expect a cold winter after a wet summer?

† Through a glass tube filled with water, Dr. Franklin passed an electric shock, the tube was shattered to pieces, and the water disappeared; a similar experiment was tried with a tube filled with ink on a sheet of white paper, the same effects were produced, the paper being neither stained nor discolored.

ration and extent. Their existence has given rise to much speculation, and even the experienced philosophy of Mr. Jefferson has succumbed to the mystery* of their origin.

Our *frosts* are sometimes equally severe and unexpected; no body placed near the earth has a temperature of its own, but is entirely regulated by that of the earth. A violent storm of rain, by absorbing much of the heat of the earth, is often followed by a destructive frost. When the power of frost reaches a certain pitch, the vapors dispersed throughout the air, yield their latent heat—the atmosphere becomes clouded, the frost is either destroyed or mitigated, and the vapors descend in rain or snow.

Our hardest frosts never penetrate the earth more than three inches, and though the leaves of the trees and shrubs are scathed or destroyed, and timber sometimes splits in the direction of the fibres of the tree, its roots uniformly remain uninjured. Those portions of vegetation which grow nearest to the earth, and those in low and marshy situations, receive the severest injuries. On the night of the 17th May, 1834, the leaves of the oak, hickory, and all the forest trees, were blighted in most of their foliage; the sycamore only remained unhurt. Frost during the winter, is a fatal enemy to those plants which are nurtured in southern exposures; they are rarely covered with snow, which melting rapidly, is converted in the course of the night into destructive ice. Our *white frost* is generally harmless, it being simple dew slightly congealed.

Dew is found in Virginia in heavy masses, generally in the months of August, September, and October; it lies in greater quantities on our flat than high lands, being collected there during the absence of the sun from the horizon, like the relics of a drizzling rain; it appears first on the lower parts of bodies, because in the evening the lower atmosphere is first cooled and most disposed to part with its vapor.

Virginia is subject to *rains* of vehement and long continuance; they fall in the largest quantity about the breaking of the winter, and in March and September; I have no *data* on which to reckon their depth † or their prevalence over the fair and cloudy days of our climate. Our valley and western regions, by the condensing power of their mountains, and our tide water sections, by the attractive force of broad rivers, have more local rains than the intermediate country, and do not suffer in the same proportion from continued droughts. If a year be remarkable for rain it is fair to conclude that the ensuing winter will be severe, from the great evaporation of the heat of the earth, and if the rains have been violent, sterility and barrenness will follow in the next year in proportion, as the surface mould so vital to vegetation has been scattered and wasted away.

Our Indian summer presents an ample field for the creations of fancy and the conceits of theory. It generally follows excessive and protracted droughts, and is dispersed by heavy rains. It has been traced to electric influence—to the burning of mountains—to the existence of numerous impalpable atoms of decayed vegetation, and has been assimilated to those light gray clouds which overhang Peru. May we not ascribe it to that mass of accumulated vapor which is precipitated on the lower atmosphere, while the continued action of the heat of the earth, and the rays of the sun conspire to produce the dense medium through which the light is so irregularly refracted?

But I must conclude my tedious communication or I shall incontinently vex you with the idle speculations of delusive theory, which in seducing from the path of truth, ever persuades us that its fond dreams are facts, and its forced assumptions, fixed principles.

W. G. M.

* May they not proceed from that latent *electricity* which pervades the air most in dry seasons, and which is attracted to the human body by its heat,—thus producing from the action of *affinity*, the feeling of sudden warmth?

† According to the observations of Dr. Sanders made near Boston during ten years, from January 1, 1821 to January 1, 1831, there were on an average in each year, 219 days of fair and 146 of cloudy weather. Rain fell more or less on 57 days. Boston is on the sea coast, in latitude 42 deg. 20—58 min. and the standard temperature of the level of the sea at that place is between 59 deg. and 60 deg. Farenheit.

ON THE ORIGIN OF THE TURNIP FLY, AND MEANS TO PREVENT ITS RAVAGES.

From the Entomological Magazine.

The turnip fly is not always of one kind, but the difference in them is not very important; for they only alter in their paint, their build is always alike. The most common is bottle-green, but in some fields all are painted black, with a white line on each side from stem to stern down the neck. They are so active, that the only way in which I could ever obtain them in newly sown fields, was by sweeping the surface with a gauze net, on an iron hoop at the end of a strongish stick. They jump like fleas as soon as they see you. This insect, or rather its grub, commences its attack on the turnip as soon as it is up, devouring the two cotyledons and the little heart, and sometimes in a few days leaving the field as brown as it was on the day it was sown. Schemes without number have been tried to get rid of or kill this little pest wherever it has appeared. I have always observed the greatest quantity of grubs on very young plants; they are very various in size, and it is not before the plants are a fortnight or three weeks old, that the beetles appear in any quantities. Yet there are some beetles observed at the first coming up of the plants. Now I know from experience, that the turnip-fly feeds on wild mustard, and several other hedge plants, and therefore it is not improbable, that when they smell the fragrance of the fresh bursting cotyledons of their favorite food, they would skip down from their spring habitations, the hedges, and make the attack. I first sowed some seed in a flower-pot, with earth out of my garden; it produced the animal in abundance. Secondly, I enclosed the pot with pasteboard and canvass, with the same success; but still there was a possibility of the enemy getting in, as I had not the cover sufficiently close. Thirdly, I made a light frame about eight inches square, covered it with very fine silk gauze, carefully stopping the crevices of the door with pasted paper, and round the pot where the cover was fastened on with putty, so that there was no possibility of any thing coming to it from without. Yet this experiment was attended with the same success;

except that one point, a negative point, was now proved, namely, that the fly did not come to the turnip from other plants, and this was a point gained. Fourthly, I baked the earth in a cast-iron pot over the fire, and used no other water to water the seed but such as I had boiled myself, applying it at the bottom of the pot with a common feeder. Then I exercised the same care, and took the same precaution as before. I did not take off the cover till the plants were of a considerable size, and I found them all a-hop with beetles. I had now made another step; having before found that the beetles did not come from other plants, it was now clear that it was not in the earth or the water. Fifthly, with a lens I examined the seed, and found on it a number of white flattish substances; some of the seeds were without any, but there were generally one, two, three, four, and in one instance five on a single seed. These I concluded were eggs, and I thought the only way left me was to attack them. It would have been easy enough to poke them off with a needle, but I could not see how I was to employ a needle and a magnifying glass on a sack of turnip seed. I therefore made some pretty strong brine, and soaked the seed in it for twenty-four hours, then dried it thoroughly, and with all the precautions which I have mentioned, I sowed it again, and there was not a single fly, neither was there a single turnip injured. I tried again and again, and I found that, without weakening the brine, if the seeds were only kept in it three hours, there were no beetles, but yet the seed came up as well as ever. I now practise this method with turnip-seed, cabbage-seed, and in fact with all the cruciform plants in common cultivation, with very satisfactory success. The whole of these experiments were made on the Swedish turnip, which is generally more infested by these beetles than any of the other sorts.

Note by the Editor of the Quarterly Journal of Agriculture.

We sometime ago mentioned, in regard to avoiding the attacks of the turnip-fly, that a farmer completely succeeded in avoiding them for many years, by rubbing, keeping, and sowing his turnip-seed among flour of sulphur. Since the turnip insect is attached to the turnip-seed, it is clear that the sulphur must have destroyed them. This attachment of the nidus of the insect to the seed is a very remarkable circumstance, and requires farther investigation than the experiments above related, to establish the fact as a general one.

THE TURNIP FLY.

Mr. Berry ascribes his success in this department of rural management, and which, he says he has observed as closely as possible, first, to sowing seed of one year's growth, which secure simultaneous vegetation, and defies the fly; the plants being numerous. Seedsmen too frequently mix the seed of different years, in consequence of which it comes out of the ground at various periods, and in such quantities, that the fly easily overpowers the crop. Second, thick sowing. It is much easier to cut out than to insert a plant. Third, sown immediately after the manure is ploughed in, by which the advantage of the moisture is secured. In showery weather, he finds an advantage in steeping the seeds in water; but if the weather be dry, steeping is injurious, the contrast being too great between the water and a dry, hot state of the earth, and the plants come up yellow and sickly.—*Repertory of Inventions.*

WHALE CHASE.

A Scotish journal, the *Caledonian Mercury*, describes the following animated scene, which took place in May last, off the town of Stornoway, in the island of Lewis. An immense shoal of whales was, early in the morning, chased to the mouth of the harbor by two fishing-boats, which had met them in the offing.

The circumstance was immediately descried from the shore, and a host of boats, amounting to thirty or forty, and armed with every species of weapon, set off to join the others in pursuit. The chase soon became one of bustle and anxiety on the part both of man and fish. The boats arranged themselves in the form of a crescent, in the fold of which the whales were collected, and where they had to encounter incessant showers of stones, splashing of oars, with frequent gashes from a harpoon or spear, while the din created by the shouts of the boats' crews and the multitude on shore, was tremendous. On more than one occasion, however, the floating phalanx was broken, and it required the greatest activity and tact ere the breach could be repaired and possession of the fugitives regained. The shore was neared by degrees, the boats advancing and retreating by turns, till at length they succeeded in driving the captive monsters on a beach opposite to the town, and within a few yards of it. The gambols of the whales were now highly diverting, and, except when a fish became unmanageable and enraged while the harpoon was fixed, or the noose of a rope pulled tight round its tail, they were not at all dangerous to be approached. In the course of a few hours the capture was complete, the shore was strewed with their dead carcasses, while the sea presented a bloody and troubled aspect, giving evident proofs that it was with no small effort they were subdued. For fear of contagion, the whole fish, amounting to ninety-eight, some of them very large, were immediately towed to a spot distant from the town, where they were on Thursday sold by public roup, the proceeds to be divided among the captors. An annual visit is generally paid by the whales to the Lewis coast, and besides being profitable when caught, they generally furnish a source of considerable amusement. On the present occasion, the whole inhabitants of the place, male and female, repaired to the beach, opposite to the scene of slaughter, where they evidently were delighted spectators, and occasionally gave assistance. A young sailor received a stroke from the tail of one of the largest fish, which nearly killed him.—*The Mirror.*

COOKING FOOD FOR HORSES.

When the food is broken down by cutting the hay and straw, and bruising, boiling or steaming the oats, not only is there less waste, by the whole being used as manger meat, but much labor is saved to the animal, in having the tough dried hay, and hard oats, masticated for him, and in a state almost prepared for digestion; and, as regards the oats, all the nourishment they can afford is readily yielded to the digestive organs; for unless the grain

is broken down, or otherwise killed by boiling, it is not acted on, and will grow as readily after having passed through the horse, as the olives have done after passing through turkeys. Oats, like every other seed, is possessed of vitality, and it would appear that the organs of digestion, and their secretions, do not act upon bodies possessing it. Were it not for this exception, the gastric juice, which acts upon and dissolves every dead matter taken into the stomach, would act upon the stomach itself; but it is not possessed of this power. It is therefore necessary to destroy the life of the food taken into the stomach before it can yield nourishment to the animal. This may be done by bruising, and the finer it is bruised the better, because it is capable of being more completely mixed with the cut straw or hay, and the whole is then more easily eaten, but as experiments of Captain Cheyne have shown, it may a'so be steamed or boiled, and given with the same advantage; and from what has been stated regarding digestion, it must be pretty obvious that this kind of cooking brings the food nearest to the state of being readily dissolved and acted on by the digestive organs. The only objection which will at once occur, I know is, that boiled or steamed meat will incline a horse to purge: this, however, is not so much the case as many, without trial, may suppose, and where it does occur, it is perhaps owing to too large a quantity being given at one time, as indeed is almost invariably the case, for stable-men, when they give boiled food, always suppose it necessary, at least the practice is, to give nearly double the quantity or more at a time than they would think it proper to give of raw food; but if the rich cooked stewed food is mixed with a less nutritious and raw material, the whole of the boiled is taken into the system, without producing the laxative effect. All horses on this restricted feeding are found to be light in their belly; but while this is the case, the appearance of their coats, the quantity of fat on their ribs, and the manner they are able to do their work, show that they have sufficient nourishment, while (what is the subject of the most important consideration) their dispensing with the doctor, shows that their health is most materially improved by it.—Mr. Dick, in the *Quarterly Jour. of Agr.*

CULTIVATION OF THE SUGAR MAPLE AND CURIOUS MANNER OF PROCURING THE SEED.

From Goodsell's Genesee Farmer.

Mr. Goodsell,—Every one is delighted to see our native forests thickly planted by the hand of nature with this valuable and beautiful tree; valuable, because for cabinet work some varieties of this wood are superior to that brought from distant climes; first rate for fire wood, and as good for the manufacture of sugar as the cane plant. And who does not regret the destruction of the axe-man amongst them. Occupying the best soil, they are usually the first victims. But he who destroys should endeavor to produce anew. No native tree can be more easily cultivated than this, the seed being abundant and easily procured. It grows rapidly from the seed in open cultivated grounds, attaining the height of six feet in three years, and in twelve years the stems will measure from six to nine inches diameter. I send you a quantity of seed as a specimen; they are ready prepared for sowing, and are divested of the shell and wings; in their natural state, being connected together in pairs, they are usually called maple keys. About a peck is sufficient for seeding three acres of ground. Nature would seem to dictate the fall of the year to be the proper time for sowing the seed in their natural form, as the effect of the frost would be to soften the shell. At this season they are scattered abroad by the wind in infinite profusion. But divested of the shell and sown in the spring they will grow as surely as peas, and make their appearance at the time the forest trees put forth. They should be sown, or rather scattered upon the furrows of dry land, and harrowed in, and grass seed should be sown for future pasture. Hogs, calves, sheep, horses, &c., may be pastured among them, but no cattle, till they are out of danger. The third year, either fall or spring, they should be taken up, where too thick, and transplanted in vacancies. One thousand may commence growing upon an acre. In twelve years, an enterprising farmer, who wishes for the future prosperity of our country, as well as to enhance the present value of his lands, would walk five miles barefooted before sunrise in the month of June, to view the "sugar bush" of our climate, in full foliage, situated near the residence of the owner, sheltering his fruit trees and habitation from storms, and the resort of the songsters of the air. The leaves of the grove might be collected for the barn-yard. At the age of twenty-five years, the trees might be tapped. I was bred upon a farm, in a deep valley of the mountains, on the eastern border of this state, and have witnessed the growth of the sugar maple in groves from the seed, and also standing singly in fields, where they have stood for more than half a century, presenting a more beautiful appearance than the trees of any land or clime. My occupation now is farming. As to the manner of procuring seed: I send you about one-fourth part of the winter store of a buck or wood-land mouse, which was deposited in a living hollow beach tree, 15 inches diameter; the whole of his store, being about one bushel, one half beach nuts, with a few other seeds, and shelled, and neatly put up for winter provision, and a nest within, lined with down, the residence of the family. A boy found another store-house the same day, which was 25th of December last, containing half a bushel of maple seeds, with others. Boys are skilful in such kind of hunting. In this way seed stores might be furnished with them from the maple forests of the west, in quantities sufficient to plant out territories and kingdoms. The buck mouse enters his habitation through a smooth hole an inch or less in diameter, into the hollow of the tree, sometimes nearer and sometimes further from the ground. At the commencement of cold weather and snow, the red squirrel visits the place daily, and endeavors with much chattering to gnaw through, to rob the mouse of his store. By this recent gnawing around the hole, and by tracking in the snow, the habitation of the mouse may be discovered. This little animal, also deposites vast quantities of elm seeds, in hollows of the branches and trunks of that stately tree. In the night seasons, when all his enemies sleep, except the owl, he is busily employed during fall months, in running up and down the tree, and laying up his winter store. The habitation of the mouse is frequently occupied afterwards by the honey bee. Whenever

the maple bears seeds, the mouse, in maple forests, is sure to have a proportion of them for his food.

S. H.

Clarendon, Jan. 25th, 1834.

FLIES.

It is well known that flies will deposite their eggs on any surface which affords a suitable nidus for them. I remember a gentleman's son who suffered severely from the larvæ (maggots) of a fly, which proceeded from eggs that had been laid in the ear; but the most extraordinary case of this sort which has come to my knowledge occurred in a negro man at Kellitt's estate, in Jamaica. He was a tradesman, and a very intelligent fellow. When I first saw him, his nose and cheeks were very much swollen, rendering his face hideous; and he suffered much severe pain. I immediately suspected the cause, and soon succeeded in making the residence of the maggots so uncomfortable to them, by application of turpentine and olive oil, with green tobacco juice, up the nostrils, that they came away gradually; but it occupied at least a fortnight before the whole were removed, so deeply lodged were they in the usual passages. I desired the man to keep a tally of the numbers of his tormentors; and he did so, I have no doubt, faithfully, after which he handed it to me, and it is still in my possession. It contains 23 crosses (X) for ten each, and V for five, amounting to 235 larvæ of, I believe, the bluebottle fly. Almost all of them were full grown, and forming, perhaps, such a brood of maggots as never proceeded from any man's head before. Flies abound upon sugar estates; and, when we recollect how often negroes go to sleep in the open air, the wonder is that similar incidents do not occur more frequently.—*Magazine of Natural History.*

NEW METHOD OF HARVESTING GRAIN.

We have examined the drawing of a machine to gather grain as it stands in the field without cutting. It is called the Locomotive Thresher; intended to be moved by horse power, and, with the assistance of three men or boys of fifteen years of age, is calculated to go over ten acres of wheat or other grain per day, and gather say two hundred bushels, leaving the straw standing on the ground thrashed as clean as is generally done in the ordinary way, thereby saving all the expense of harvesting; and by ploughing in or burning the straw, it is supposed the ground may be tilled *ad infinitum* without diminishing its fertility. Should this invention succeed, it will afford another inducement for farmers to inhabit and cultivate those beautiful prairies which abound in the far west. The ingenious inventor is Mr. John T. Vail, of La Porte, Indiana, formerly of this town. —*Rahway Advertiser.*

THE AERIAL PLANT.

The burning sands of hot climates, even at Karsfields of the Cape of Good Hope, which are so arid and scorched that no water can be extracted from them, are the media in which the most succulent vegetables of which we have any knowledge, flourish and evolve; so deleterious indeed, is a wet season to their growth, that they are destroyed by it.

There are also various tribes of vegetables that are destitute of roots, and which can only be supported and nourished by the air, and by the moisture which the atmosphere contains. A large portion of the class Fuci, have no root whatever; and it is stated that the Ærial Epedendron, (the Epinendron Flos Æris, denominated aerial from its extraordinary properties, and which is a native of Java, on account of the elegance of its leaves, the beauty of its power and the exquisite odor which it diffuses, is plucked up by the inhabitants and suspended by a silken cord from the ceiling of their apartments, from whence it continues from year to year to put forth new leaves, to display new blossoms, and exhale new fragance, although fed out of the bodies before stated.—*London Mag.*

MILKING COWS.

The operation of milking is performed differently in various parts of the country. In some, the dairy-maid dips her hand into a little milk, and, by successively stripping the teat between her fingers and thumb, unloads the udder. This plan, however, is attended with the disadvantage of irritating more or less the teat, and rendering it liable to cracks and chops, which are followed by inflammation, extending to the rest of the quarter. This accounts for the disease occurring more frequently among the cows under the charge of one milker than it does in those under the charge of another, and as this practice is more common in some parts of the country than in others, it also accounts for the disease being more common in these parts. This plan of milking where the irritation is not sufficient to excite the extent of inflammation as above, frequently produces a horny thickening of the teat, a consequence of the cracks and chops, which renders it more difficult to milk than when in its natural state, and at the same time predisposes to inflammation, when any cause occurs to set it up. These effects may be, and is almost entirely, avoided by the more scientific plan of milking adopted in other parts of the country, where, instead of drawing down or stripping the teat between the thumb and fingers as has been stated, the dairy-maid follows more closely the principles which instinct has taught the calf. She first takes a slight hold of the teat with her hand, by which she merely encircles it; then lifts her hand up, so as to press the body of the udder upwards, by which the milk escapes into the teat, or if (as is generally the case when some hours have elapsed between milking times) the teat is full, she grasps the teat close to its origin with her thumb and fore finger, so as to prevent the milk which is in the teat from escaping upwards; then making the rest of the fingers to close from above downwards in succession, forces out what milk may be contained in the teat through the opening of it. The hand is again pressed up and closed as before, and thus, by repeating this action, the udder is completely emptied, without that coarse tugging and tearing of the teat, which is so apt to produce disease.—*Quarterly Journal of Agr.*

CHIMNEY SOOT AS A MANURE.

This article is said to be an excellent manure, if properly applied. It is generally mixed up with earth and dung as a compost; in this state it is

worth little or nothing; but when properly applied, by being kept dry, and sown on young wheat, clover, or vetches, in March or April, its effects are most extraordinary; in a few days the yellow sickly plants will assume a dark green, which is as much a test of health in plants as the rosy cheeks of a dairy-maid. The fact is, plants receive nearly as much nourishment from the air as the roots; and as the soot is throwing off abundance of gases, which are imbibed through the pores of the leaves, it gives a healthful vigor to the plant, and enables it to throw forth its roots to supply nourishment during the stages of blossoming and perfecting the seed.—*Repertory of Inventions.*

TOBACCO CULTURE—NO. 3.

[Continued from p. 752, Vol. I.]

To the Editor of the Farmers' Register.

Cutting and Curing.

The process of cutting tobacco, is so simple and so generally understood, that it scarcely needs an explanation; the whole art consisting in placing the knife on the top of the stalk in such a direction as to split the stalk nearly to the bottom leaf, without cutting off the leaves. The stalk is then to be cut off immediately below the last leaf, and the plant is then set up on the ground, with the but of the stalk up, so as to expose the stems of the leaves to the sun, that the plant may become limber enough to handle without breaking. The splitting of the stalk, answers the double purpose of hanging the plant on a stick, and rendering it more easy to be cured by fire. Tobacco should not be cut early in the morning, when the dew is on it; as it will thus become very dirty if set on the dry ground. But these suggestions are but of little importance when compared with the difficulty of determining with precision, when the plant is at its greatest perfection. Or in other words, *how* to cut, every planter knows, but *when* to cut, has been a matter of dispute, even amongst the best informed, and most skilful planters. Some contend, that tobacco should get very ripe before it is ready for the knife. That is, it should become in the general, full of yellow spots all over, and that the leaves when doubled, and pressed between the fingers, should split, or break freely—while others contend, I think with more plausibility, that it ought to be cut before the grain of the leaves will crack freely, when pressed as above described. It is manifest to me, not only from the reasonableness of the thing, but from experience, that tobacco is at its greatest perfection in quality and weight, before it becomes very full of yellow spots, and also, previous to the grain breaking freely when pressed: for it seems clear to me, that its getting very spotted, and very brittle to the touch, are both evident marks of the plant being on the decline, and of course, must have lost, some of its essential oil, together with its silkiness, and tenacity of texture. The heaviest and highest priced tobacco, I ever made, was cut at the stage above described. I am therefore convinced, both from experience and observation, that many good planters loose both in quantity and quality, by letting their tobacco stand too long in the field. The tobacco then being thus cut, and sufficiently limber to handle without breaking, the sticks should be brought into the field, the plants picked up, and eight or ten plants put on each stick, having first stuck the end of each stick obliquely into the hill under the roots of the stalk, so as to keep the tobacco from the ground. I think this the best mode, as the tobacco may safely remain in the field all day, without injury, when making a large cutting, (which is often necessary) and also, can be more safely, conveniently, and speedily removed to the scaffold, or barn, as circumstances may require. If the weather should be fair and mild, after cutting it is best to scaffold it three or four days, that the sun may commence the curing process, by yellowing the plants, killing the staiks, and reducing the sap—all of which contribute much to the successful application of fire. If the tobacco is hung on scaffolds, the sticks should be pressed close together, to prevent the sun from burning it, and also to hasten the process of yellowing the plants. But on the other hand, should the weather be rainy or windy about the time of cutting, it should be removed immediately from the field to the barn, and hoisted up, leaving a space of from eight to twelve inches, between the sticks throughout the house according to the size of the plants. I see my neighbor J. F. Edmunds, who is one of our most skilful planters, has recommended the plan of putting the sticks about half the distance in the top of the house, that is customary, and gradually widening to the bottom —say five inches at top; and eleven at bottom. I think this a valuable suggestion, as I know the tobacco in the top of the house always cures first. This plan will retard the curing of the top, and consequently bring the top of the house on an equality with the body, and must therefore give a more uniform house of tobacco. The heat being always concentrated in the roof of the barn, I have invariably observed that the tobacco when cured, is much darker in the roof than the body of the house. If this reasoning then, is correct, there is a two-fold advantage in this plan—that is, a saving of room, as well as a more uniform house of tobacco. But to return from this digression. The planter having his barn well filled with tobacco and a large quantity of wood prepared, both green and seasoned, he commences his fires, with mingled feelings of hope and fear. For I may truly say that this is not only the most difficult part of the whole management of the tobacco crop, but the most slavish and hazardous. This is the rock on which the hopes of the planter have been often suddenly dashed; for no matter how fine the tobacco, or how skilful the planter, if outward circumstances should be unfavorable, high winds, &c. it will be impossible to cure a good house of tobacco. The curing process has always been a most difficult and dangerous one, but has been rendered doubly so for the last ten years, by the demand for bright French tobacco. Were a stranger suddenly to open one of our *cellared* barns, (where the fires had been unremittingly kept up, from Monday morning until Saturday) and see one of the hardy sons of Africa, with his red eyes and sooty locks, he would imagine himself on the borders of the infernal regions. But thanks be to the whimsicality of the French, or the avarice of the Scotch, or whatever other cause that has put this kind of tobacco out of fashion, for it will save the planters many a load of wood, and many a sleepless night, and me much time in describing the tedious process of curing it. As the old fashioned dark tobacco is now in demand, instead of

taking a week to cure a house, it can now be done in three days, with half the care and trouble. As I am writing on the eve of a change of fashion in tobacco, I shall not attempt to describe the process of curing with that minuteness that accords with my original design, but shall content myself with remarking, that as there has been a radical change in the sort of tobacco in demand, within the last twelve months, it is not yet ascertained what particular process of curing will suit the capricious taste of the foreign consumers, or the still more fastidious taste of our domestic purchasers. I think I can however, very safely congratulate the planters of our country on a change, contributing so much to lessen the labor and expense of curing their crops. This brings me to the consideration of the fourth branch of the subject, that is, the stripping and pressing of the crop, which will form the subject of my next communication.

G.

Wardsfork, Charlotte Co.

MANURES.

To the Editor of the Farmers' Register.

Will you permit a constant reader of your valuable journal to propose a subject for an article? It is this: "The best method of collecting, preserving, and applying manures." If the subject is too extensive, I should with others, feel much indebted to some good practical farmer, who will give your readers an essay on the "*Application of manures*"—including the time when the land should be manured—the state of the manure—method of applying—whether it should lie on the land any length of time, or be immediately turned in with the plough, &c., &c. This last part of the subject I think deserves particular notice.

A large portion of your readers reside in a country where "calcareous manures" cannot be procured, but at some considerable expense; and the valuable works already published would obviate the necessity of touching on that branch of the subject proposed.

O. P. Q.

ON THE PRESERVATION OF PLANT BEDS FOR TOBACCO.

For the Farmers' Register.

Owing to the extravagant custom of selecting and burning new beds for plants every year, the land best adapted to plant-raising has become in many parts of the country very scarce. Hence the great difficulty of planting at a seasonable time the tobacco crop, upon which so much is dependant as to the product. The difference between a late and forward crop, the past experience of all tobacco growers can abundantly testify. It is not my object to say any thing respecting the many disadvantages, and great loss to the planting interest arising from late crops. But I propose inviting attention to the importance of preserving such land as is best adapted to raising plants, and to state some experiments which I have tried with considerable success. The general impression is, that plants cannot be raised with as much certainty on old as new beds. The former generally are in open fields, and more exposed to the winds and sun, which cause them to dry much sooner than the latter, which are almost invariably in the woods, where they are better protected. I believe that but little, if any difference has been observed in beds similarly located and properly managed.

Many expedients have been tried, and some have failed, whilst others have succeeded, in raising plants on old beds. For the last six or eight years, I have raised fully half of my plants from old beds, some of which have been burnt regularly during the whole time, and are more productive now than when first burnt.

I will mention two or three expedients which I have tried with considerable success. Covering the bed with leaves or brush, serves to protect it from the sun and prevents grass from putting up and seeding, which is very desirable. The only objection to this mode is that the bed will need manure every year, and the difficulty of getting such as is suitable, and free from grass seed, is, and has been, the great objection to this plan. As a remedy I will suggest an experiment I made and with which I was much pleased, in consequence of its success, which was this: as soon as I had drawn all the plants I intended from the bed, I penned my cattle on it until it was well manured—(care should be taken not to suffer them to go on when the land is wet.) It is important that this should be done as early as possible, that it may be sufficiently manured before the grass seed is ripe, which will be a great economy of labor and wood, as the bed will require but little burning—(the land having been once well burnt.) So far as my experience serves, this supersedes the necessity of manuring after the plants have come up, which is a very troublesome job, and but little of our lands now left for this purpose will bring plants without it. So soon as the cattle are removed, the bed should be covered with brush until the fall or early in the winter, when it may be removed, in order that the bed may dry for burning, which if done during some dry spell at that season, will require very light burning: frequently brush will be sufficient, provided no grass has been suffered to grow and seed on the bed. It would be well to pay some regard to locality in making a selection for a standing bed. Under our present plan we will soon be deprived of all those spots so favorably situated for watering, and so have increased the difficulty of raising plants. Would it not be well to preserve such spots as can be conveniently watered? I have no doubt, from a little attention to this subject, that we may with less labor and with equal, if not greater certainty, raise an abundance of plants, by burning (instead of the whole) say one half new, and the balance of old beds.

H.

NEW SPECIES OF WHEAT.

A variety of wheat which does not seem liable to the attacks of the wheat-fly has been accidentally found. It is most prolific, grows a foot taller than the common wheat, but is not like the Revel wheat. It is awned, and somewhat like the Egyptian, but of a clearer color, without the protuberances of the latter. If once a supply of this variety for seed is found, the fly will be starved. Of a patch standing in the middle of a field, where every ear of the common wheat was hurt, and where flies were very numerous, not an ear was touched, although other bearded varieties suffered.—*Mr. Gorrie: Highland Society Transactions.*

REPORT ON FARMS, OF THE COMMITTEE OF THE AGRICULTURAL SOCIETY OF ALBEMARLE.

Made to the Society at their Show and Fair, 21st October, 1828.

We the undersigned committee acting under an order made by the Agricultural Society of Albemarle at their meeting in May last, and appointed to view the farms offered for premium, commenced our duty by viewing the farm of John H. Craven (one of the competitors) on the 20th of October. We found that part of his farm, called Pen Park, on the western side of the river in a rapid state of improvement; and, from the information of Mr. Craven, together with the knowledge of some of the committee as to the exhausted state of this part of his farm when he came into possession of it, are of opinion that it has been judiciously managed. But that part of his farm called Franklin, lying on the eastern side of the river has not improved so rapidly, which may have been caused by closer grazing or more frequent cultivation.

On this farm the negro cabins and other out houses are very good, and his farm pen shows, that there is great attention paid to his stock, which are of superior quality for this section of country. His horses, colts, hogs, &c. appear to have been well attended to.

We gave Mr. Craven and all the other competitors a copy of 22 questions marked A, with a request that they would answer them as explicitly and with as much accuracy as circumstances would admit, in their several reports. They have been answered by Mr. Craven in his report marked B.

On the next day we proceeded to view the farm (Ridgeway) formerly the property of Peter Minor, dec'd. This farm, when Mr. M. came into possession of it was, we believe, the greater part, in woods; consequently, we suppose, fertile when cleared, and comprehended likewise a large quantity of alluvial land, of fertility almost inexhaustible. We know of no farm for which nature has done so much. These circumstances together with tolerably good management, have made it, perhaps, the most valuable farm within our knowledge.

There has been more stone fencing done on this farm than any of those exhibited for premium, and the out houses (viz) negro cabins, tobacco houses, mill, barn, &c., have, we think, been judiciously arranged, and, are of superior quality. Most of them are built of stone. The work horses on this farm are of superior quality and well attended to. We gave Mrs. Minor also a copy of our questions marked A, to be answered in her report which we have received marked C.*

We viewed Wm. H. Meriwether's farm next. This farm is in a state of improvement, and a very valuable plantation. But, from the circumstance of his cultivating large crops of tobacco, and appropriating the greater part of his manure to the cultivation of this crop, his farm has not improved so rapidly as it would otherwise have done. This crop has also prevented paying that attention to neatness, &c. which usually goes hand and hand with good farming. Our questions have also been answered by Wm. H. Meriwether marked D.

We next, and lastly, viewed the farm of John Rogers. This farm, we think, has been most judiciously managed as it regards profit, neatness, improvement of the soil, arrangement of the fields; and in fact all his management denotes him as being a farmer of more than ordinary merit. We have therefore awarded to John Rogers the premium of $50 for the best cultivated farm.

We furnished Mr. Rogers also with a copy of our questions marked A, which he has answered in his report marked E. This report has entered less into detail and is less explicit than we could have wished, but he has made an apology to the Society, and a promise to us, that he will at our next spring meeting give to the society an account in detail of his whole progress from the commencement of his operations to the present day.*

In awarding the second premium the committee confess themselves to be somewhat at a loss. Here two farms come into comparison; one worn out and exhausted at the time the owner came into possession of it; the other but very recently cleared and but a very small portion of it that was ever worn out and possessing immense resources for fertilizing itself.

But Mr. Craven has, notwithstanding his limited resources of both money and manure (too very important articles in making an exhausted farm rich,) not only improved his farm as it respects fertility of soil, but has added much to its appearance by the stoppage of innumerable gullies; and a considerable quantity of stone fencing put up in a very handsome manner.

Taking all the circumstances into consideration relative to these two farms, we have given Mr. Craven the preference, and, accordingly, award to John H. Craven the premium of $25 for the second best farm.

The above reports together with the several reports of the competitors, are respectfully submitted to the society, and the committee beg they will take those reports as part of their own.

N. H. LEWIS,
JAS. CLARKE.
JOS. HARPER.

Question 1*st.* What is the number of acres in your tract of land, and what proportion of it is in cultivation?

2d. How many changes or fields have you, and what are their size?

3d. What is your rotation of crops?

4th. At what season of the year do you plant or sow the principal seeds; (viz) corn, wheat, rye, oats, and clover, and in what manner do you prepare the earth for them?

5th. What is your mode of cultivating the crop of corn?

6th. What quantity of wheat do you sow to the acre, and do you vary the quantity according to the quality of soil and season when seeded?

7th. What kind of wheat do you think most productive, and are you particular in selecting the best for seed?

*The report marked C, was by permission of the Society, withdrawn.

*This report was withdrawn by Mr. Rogers; and in its stead, the fuller and more satisfactory one which now accompanies this publication handed in.

8th. In what manner do you gather your small grain? with the cradle or sickle? and why do you prefer one over the other?

9th. What was the average product of your farm in wheat and corn to the acre when you commenced your operations on it, and what is it now?

10th. How many laborers do you work regularly on your farm, and of what description? and are you in the practice of employing day laborers?

11th. How many horses, mules, and oxen do you work? do you raise them, and what is their relative value on a farm?

12th. What do you feed your horses, mules, and oxen, with, and in what manner is it prepared for them?

13th. What kind of plough do you prefer, and what are your reasons for that preference?

14th. How many horned cattle do you keep on your farm and of what description? Do you keep more than enough to supply the farm?

15th. How many hogs and sheep do you keep, and what is your manner of feeding them?

16th. Do you pen your stock at night during summer? If so in what manner do you confine them?

17th. What quantity of manure is annually made on your farm? of what description? at what seasons carried out, and in what manner do you apply it?

18th. What is your opinion (founded on experience) of the efficacy of plaster, in what quantities, at what seasons of the year, and what kinds of crops it can be most profitably used on?

19th. What quantity of clover hay do you cure per annum? how much per acre? what your process in curing, and in what manner do you preserve it after it is cured?

20th. Do you gather your own clover seed from the farm? If you do, in what manner?

21st. Have you been aided in the improvement of your farm by means of any other resources than those received from the farm exhibited for the premium?

22d. What is your mode of managing your negroes?

B

In reply to the questions propounded by the Committee of Judges on farms, the undersigned answers as follows:

Question 1*st*. My tract of land contains 875 acres, of which I have about 500 acres under cultivation.

2d. Which is divided into ten fields of very unequal size as before explained to the committee in my report to them, of which ten fields I have separate and accurate plats.

3d. My rotation of crops is one fifth part or 100 acres in corn, two-fifths or 200 acres sowed down in small grain, say wheat, rye, and oats, of which the principal part is wheat.

4th. I prepare the soil for oats and corn as soon after finishing the seeding of my wheat crop, as I can, commencing about the 1st of November, and frequently finish the breaking up by the end of the year. I prefer sowing my crop of oats early in March, on the land flushed during the fall and winter, without any other preparation; and harrow them in with a heavy harrow, drawn either by three horses abreast, or three oxen, two under the yoke, and one with collar and hames. I think this the best way to work oxen either in the cart or harrow, as the single ox turns with much more ease than when encumbered with the yoke. I have sometimes been obliged to vary my mode of preparing the land for corn; for instance, it does not answer to flush a blue-grass turf in the fall of the year, for it will grow back, and be worse to plough by the spring, than if it had not been broken during the fall and winter. I prefer breaking this kind of land the last of April, and harrowing it very well with a heavy harrow, the way it was ploughed, for fear of turning the sod back and planting the corn immediately, which I have always found best to be done with a shovel plough having a coulter on the point, with which I open the furrow; and then cover the corn with one of the same kind. As soon as the corn is large enough to bear the large harrow, I pass it over it backwards and forwards on the same row, following with small rakes, with four flat iron teeth, about three quarters of an inch wide, with a very small hoe or chisel in one end. With this I rake the turf and clods off the corn, and with the small hoe replant, and chop up whatever may be likely to choak the corn in the young state. I am now speaking only of the management of blue-grass land. As soon as I can get over in this way, I follow with cultivators once or twice over, and finish with the shovel plough, with the coulter on the point, during or soon after harvest. My mode of cultivating corn on land not set with blue-grass is somewhat different. Instead of using the cultivators after the large harrows, I run the naked coulter next to the corn on each side, and use the cultivator for the middle of the rows until the last time, when I generally plough the land all over, as close as the furrows can be laid. My preparation for wheat is very simple. I commence fallowing very soon after harvest, for two reasons: the first is, to let the clover seed ripen by which the expense of purchasing seed is saved; the second is, to save the labor of re-fallowing, as I think one ploughing amply sufficient, if done at the proper time. I sow my rye from the 1st to the 20th September, at which time I commence sowing wheat, and consider from that time to the 20th of October, the prime season. I am sure it ought not to be sown sooner, and the crop is very uncertain if sown later. I sow all my clover seed the last of March or the first of April.

6th. I formerly sowed from one bushel to five pecks of wheat, to the acre of land, but now sow from five to six pecks to the acre, agreeably to the quality of the land, and the time of seeding, as also the condition in which the land is when seeded, sowing always thicker on rich land than on poor, as also on rough land than on smooth, where all the seed can vegetate, as also late in the season, to enable the wheat to make its way earlier in the spring, to escape the rust.

7th. I have for many years sowed the most of my crop of the Lawler wheat, and (although not the most productive when the other kinds come in well) I have yet considered it the safest crop, from its capacity of resisting the fly more than any other. I am now sowing largely of the New-York Flint wheat, which has done well. I always select the best I have for seed, taking care to let it remain longer in the field, so as to become riper than the general crop.

8th. I have generally saved my grain with the cradle, where not too heavy, but should prefer reaping all heavy wheat with the sickle, it being much the neatest way to save all grain of this description.

9th. For several years I made not more than eight bushels of wheat to the acre; my crop of 1827, made nineteen bushels to the acre, and of the present year, 1828, the average has been but about fourteen bushels per acre; although, the prospect until within a very few days before harvest, was better than it had ever been before, but the crop was shortened by the hot and damp weather, and rust consequent thereon. I am unable to say what the increase of the corn crop of 1827 may have been, for my crop was so much injured by the cut worm, that it did not yield half a crop, and in consequence of the drought of the present year, 1828, I do not make half a crop.

10th. For the last two years I have worked 18 hands on this farm, viz: eleven men, six women, and one boy, with the addition of three watermen, (from harvest until we have tides for running the boats, say, two months generally.) I never employ any day laborers except in harvest, some few small chaps to assist in gathering wheat, whose wages do not amount in any year to more than thirty dollars.

11th. I work twelve horses and ten steers. Of the former, two are used as carriage horses, when occasion requires. All the horses except one have been raised by myself, and so have the oxen. I have no mules, and have never had any, and can therefore say nothing of their comparative value with horses and oxen. The horse answers for some purposes, for which the ox does not so well; yet I am at a loss to decide which animal is the most valuable. The horse certainly costs much the most, either by purchasing or raising him; his keeping and feeding are also much more expensive. I think every farmer ought to raise all the horses and oxen he uses. I never feed my horses on corn unground; their principal food, is chopped rye and corn, and ship-stuff, mixed with cut oats or rye straw. During the winter seasons, when my horses are not at constant work, they are fed with but little else than clover hay, on which alone, they will keep in good condition, if the hay be of good quality and cut before it gets too old. My oxen are fed with very little grain, even when at work; if they are plentifully fed with good hay or fodder, it is generally sufficient; but, when necessary to give any thing else, I have commonly used the offal from the mill, say, wheat bran mixed up with the chaff from wheat, which is a very valuable article used in that way.

13th. I decidedly prefer the old bar-share plough, with the cast iron mould-board to any other ever used by me, both for the superior manner of its performance, and for its strength and durability; also, for the great ease, with which its work is performed, both for man and horse.

14th. I generally have from sixty to seventy head of horned cattle on this farm; say, from twenty to twenty-five milch cows, ten work-steers, the balance, young cattle to keep up the stock. My stock of milch cows is larger than necessary for the use of the farm; but I have established a large dairy, from which I market the surplus butter; and besides, the milk is a most valuable article with a large family of young negroes, and with my present stock of milch cows, I have much more than they all can destroy during the summer season.

15th. I raise on this farm about sixty head of hogs for pork, annually; which, with the surplus sent from the mill, amounts to about one hundred head, which I have slaughtered annually, for several years past. I think every farmer ought to raise at lease as much pork as is necessary for the consumption of his farm. I have no particular mode of feeding them; but keep them under good shelter during the winter, and give them as much corn as will keep them in a thriving state, until I can get the grain thrashed out of one of the fields; I then endeavor to have them shifted from field to field, until they glean the whole, by which time they are frequently good pork: my plan is never to suffer them to fall away after this, but to feed them with something until the corn gets hard enough to complete the fattening, which I always endeavor to have done by the time the weather is cold enough to have them killed. I have eighty head of sheep on this farm—my mode of feeding them is very simple: indeed, some winters I feed them not at all. If they can run on an old clover field, they will winter very well, except when there is snow on the ground, at which time I give them nice blade fodder, with an ear of corn a piece per day. I also endeavor to sow a lot of rye forward, so as to turn the ewes upon it, when they begin to lamb, which is the best food they can have.

16th. I have always penned my cattle, summer and winter, and have manured more land in this way than any other, and with less labor; taking care always to keep the pen well littered with straw or leaves from the woods, both before they are put in, and afterwards, when necessary.

17th. This question is answered in my communication to the judges.

18th. This question I consider fully answered also in my communication.

19th. This question being only answered in part, I will state that the quantity per annum is variant from fifty thousand pounds or less up to one hundred and fifty thousand, which I have saved this season. This quantity was cut from about fifty acres of land, which is three thousand pounds to the acre. My plan of curing is very simple and easy; I cut the clover and let it lie in the swath one day: as soon as the dew is a little off the next morning, I rake it up in wainrows, and let it lie in this situation until evening, when, if the day is a good one, it is sufficiently cured to put up in small shocks, in which situation it remains two days longer, when, I commence stacking or housing, as the case may be. I always haul as much to the stables as will be sufficient for my work horses and oxen. I have of late years put it up in large ricks, of fifty thousand pounds, which I have in some of my ricks this season, thached with long rye straw so as to preserve it as completely as if it were in a house or barn. Indeed, it is much easier to put it up in this way, than to put it away in the house. The mode is, simply, to make a foundation of rails, straw, or any thing else that willl keep it from the ground, and go on to stack it on ten or eleven feet high without paying any other attention than to keep the middle a little rounding, and to incline a little out, so as to give the stack or rick a little bulge to prevent the rains

from driving in. I then commence the thatch, which any handy laborer can execute. The process is, to spread a layer of straight rye straw all around the stack, two or three inches thick, and sufficiently far out to form an eve with the butts out. I then go on to finish the stack or rick, by drawing in, and thatching every two feet, with the straw turned head out, after the first layer, and the straw kept as far out as it will lie on the stack, until brought to a sharp edge on the top, which is finished by tying faggots of rye straw, and straddling the top, which is confined down with a pole.

20th. I always save my own clover seed, principally by combing with hand combs, when the clover is not too much tangled for the combs to work. I have saved the seed this season from the whole of the land, from which I mowed the one hundred and fifty thousand pounds of hay, and am sure that it cannot be less than fifty bushels, and may be one hundred.

21st. I consider this question fully answered in my communication to the judges.

22d. I have never considered my management of my slaves to be correct, having always been too much in the habit of scolding, as a substitute for correction; but I have little doubt that I have always got a reasonable quantity of work from them. My first care is to see that they are both well fed and clothed, and although it is greatly to be lamented, that as they are better treated, they are apt in the same proportion to behave worse, yet I have never felt ease or content, when knowing that they were in want of either, and have therefore provided them with comfortable houses, good clothing, and a plenty of food: this, I consider not only the duty, but the interest of every master. The most difficult part of their management, is the regulation of their discipline in such manner as to ensure their observance of it, without so far cowing or discouraging them, as to render them inactive in, or indifferent about their labor; for under such circumstances, the master or overseer will find much more difficulty in obtaining from them their due, and necessary portion of labor. I seldom require of my slaves to work in the night, and am careful that they always have labor to perform within doors, in bad weather. It is a great advantage to own slaves in families, in order that the husband and wife may be always together at home. The double consequence is, that they are more comfortable and happy, and much more valuable; and besides of easier management. Under conviction of this truth, I have, by purchase, sale, and exchange, so managed, as to have but two slaves at home, who are not thus settled with their wives or husbands; and these two, are slaves which I have lately acquired, viz: only two years since.

I now submit to the committee, a detail of the nett proceeds of my farm from the crops of the two last years, viz., 1827 and 1828; the crop of the latter not having been sold, though the crop of wheat is all delivered at the mill. My crop of 1827, was as follows:—One thousand eight hundred and seventy bushels of Lawler and Mexican wheat, which brought me in Richmond, in flour, five dollars per barrel; say, three hundred and thirty-nine barrels at five dollars, delivered by my own hands, and thirty tons of plaster brought in return loads. - - - $1,695

My crop of tobacco sold for - 730

I hauled from this farm this year, about five hundred loads of wood, with the teams and hands which made the crops at one dollar and fifty cents per load. - - 750

$3,175

To this, may be added, oats sold, - $120
Bacon and pork sold, - - 120
Six hundred pounds of butter at 1s. - 100
Ten veals, sold at five dollars each. - 50

$390

JOHN H. CRAVEN.

Communication to the Judges referred to, in the preceding Answers.

The undersigned, reports to the judges appointed by the Agricultural Society of Albemarle, to examine and report on the farms offered for premium, that he had been in possession of that part of the farm offered for the premium, known as Pen Park, eleven years; and of that part lying on the east side of the river and called Franklin, eight years. The first, or Pen Park, had been entirely exhausted for many years. As evidence of this fact, it was leased to a friend of mine in 1803, with several hands, for less than the hands would have hired for without the farm; and such was its extreme poverty at that time, that, although the lessee cultivated only the best parts of it, he was never able, although an industrious, managing Dutchman and a good farmer of the day, to raise more than three bushels of wheat to the acre. So well known was the character of the farm for poverty, that, although the mansion house was much better than is usual on lands offered either for sale or lease; yet, for several years neither purchaser or tenant could be found, and for some time, it lay out as a common. The recollection of some of you, gentlemen who have known the farm as long, or longer than I have, might supersede the necessity of further particulars on this subject. I will however, mention a conversation that occurred very soon after I made the purchase, between myself and one of my neighbors, who had been partly raised on the farm, and himself a judicious manager. "Well, I am told you have purchased the Park." "I have." "Do you ever expect to make a farm of it?" "I am going to try." "If you ever do, I will agree that I am no judge of land. It is impossible. I admit there is a part of it that you may improve, but there is a great part of the land, that has no foundation, was always poor, and can never be made rich." A gentleman who had lived on the farm more than thirty years ago, on seeing it last summer, remarked to me "Sir, you have not improved this farm—you have created it."

I will here mention to the committee that I never have had funds in hand. I have not only gone in debt for the land, but have had to get hands and stock from the proceeds of the land; which circumstance has certainly prevented me from improving as fast as I otherwise should have done.

When I purchased this farm there was only a temporary fence around the open land, and nothing like a rail or cross fence upon any other part of it. A barn standing upon eight tottering blocks, the hull of a large house, without either glass, plaster-

ing, or paint,—these, with a dilapidated dairy and a few wretched negro cabins constituted the improvements.

This being the general condition of the farm when I became the purchaser, it was my first object to get it laid off into four fields, or shifts. Its situation not admitting of the fifth shift, I was compelled to substitute that from some other part of my land, as I am never willing to cultivate a field in corn more than once in five years. But I was compelled to depart even from this order in the first round that I took, as in all the fields there was a large proportion of the land that was not worth cultivating in corn; indeed there are small parts of two of the fields that have never been cultivated in corn yet. My rotation is, No. 1, corn, seeded down with wheat, rye, or oats, and with clover the last of March, or first of April. No. 2, fallowed for wheat, and sowed down in clover in like manner the second year. No. 3, in corn, and sowed down in like manner. No. 4, fallowed and sowed down in like manner the third year. No. 5, in corn, and No. 1 in fallow. As I never fallow until after harvest, I have seldom found it necessary to sow clover in my fallow land; indeed, I have several times had my land well taken with clover after being cultivated in corn, and some of the thickest and most regular clover I had this season, was after a crop of corn. Thus you will observe each field gets two entire years rest in five, which, under a good cover of clover, and a bushel of plaster to the acre, with as much manure as the farm will produce, converting every thing susceptible of it into manure, and taking great care to get the whole on the ground before it goes through the fermentation if possible, gives a good assurance of considerable improvement. During the summer I seldom move the manure out of the stable, until the cart is ready to haul it out; and during the hot weather I prefer to have it ploughed in immediately.

That part of the farm lying on the east side of the Rivanna, of which I have been in possession eight or nine years, is divided into six fields of very unequal size. Two causes render this unequal division necessary. One is, the irregular meanders of the river on one side of the farm, while it is divided in two by a public road running directly through it: the other is, the running the fences in the valleys, that horizontal ploughing may be more perfectly done; so important in our hilly lands for their improvement, and for the greater expedition and facility of ploughing deep. And I am decidedly of opinion, that our deeper ploughing is one great cause of the advancement in agricultural improvement of this county, beyond some of those adjoining. I believe there is no one among us, at this day, who is not satisfied that the deeper he ploughs, the more his land is improved. How different from the state of things twenty years ago! when, nineteen out of twenty of the old settlers thought it would ruin the land. I have been asked the question very often, if I was not afraid of injuring the land by ploughing so deep; so far from it, I am disposed to consider that a principal cause of its improvement. There is nothing in which I am more particular, than in seeing that my ploughing is well done—and my constant directions to my ploughmen are never to fear ploughing too deep, if the horses can pull the plough. I still prefer the old bar-share plough to any other I have ever used; considering it superior both in durability, and the ease with which it works both to man and horse.

I have now a plough of this description which has been in constant use for eight years, while I have never been able to procure any other kind that will last me two years. The great objection to the M'Cormick plough, is, that it has not strength enough for our rough lands.

It was my practice some years ago to break all my lands with four horses, but from the great disadvantage in turning and ploughing round the hill with four horses, I now work three horses only, which I think are as few as can possibly do the work well.

My long and constant practice has been to raise every thing on the farm for its support; say horses, hogs, cattle and sheep—I have on my different farms, thirty-six head of horses; thirty-two of which I have raised myself. I not only find it more convenient to raise than to purchase, but the horses are really more valuable; and it is much more convenient to sell a horse now and then, than to purchase one, when I have not the money to pay for it. Every farmer certainly has it in his power to raise his own horses. Some of the best horses I have ever owned were raised until they were fit for work, without having eaten one barrel of corn or grain of any kind. I have no doubt it will be found to be the interest of every farmer to feed all the provender he raises on the farm, to his own stock in preference to selling it; and that the farm will be much more benefited by it. I have also endeavored to manufacture as much of the clothing necessary for the use of the family, (black and white,) as possible, from materials raised on the farm; say wool, flax and hemp, the cotton yarn being purchased in preference to spinning it.

I must be excused by the committee from stating any precise amount of the nett proceeds of the farm now offered for premium, having always, without distinction, blended together the crops from my different farms: nor am I able to say precisely what force I work on these farms—It is not, however, less than eighteen steady hands, men and women, with the addition of four or five boatmen, during the season that boats are not running.

As far as I am able, I will now proceed to give a statement of my two last crops, commencing with the field No. 3, at Franklin. The crop of 1827, was seven hundred and fifty bushels of Lawler wheat, from less than thirty acres. The house, yard, and garden, stand in the middle of the field, and must occupy more than one acre. My crop of the last year from the same farm, field No. 1, containing ninety-one acres, produced twelve hundred and fifty bushels. This crop was very much injured by the rust, none of the wheat weighing more than fifty-seven pounds to the measured bushel. Ten or twelve acres of this field also were very poor, having been entirely gullied when I purchased the land; and this was the first crop made from it. My crop of wheat, rye, and oats, from the field No. 1, on the Park farm, was—wheat, four hundred and fifty bushels; rye, four hundred bushels; and, oats, five hundred bushels. This was after a very heavy crop of corn the preceding year. On this same field the present year, I have cut more than one hundred thousand weight of clover hay, from less than half the field, not having cut any except where the clover was very heavy. My constant care has been to keep every

part of my land covered with clover, and I believe you will not, at this time find one acre of my land not under cultivation, that is not pretty well covered with clover, nor is there a single acre of gullied or galled land that has not been brought under cultivation. I must here mention, what should perhaps more properly have been mentioned before, my plan of improving this kind of land, of which I have had a great deal to manage. I have always made it a point to haul as much of my straw back into the fields, as I could conveniently spare from the use of my stock during the winter, and to cover these galls or sores about twelve or fifteen inches deep, in return loads while thrashing. In this way I get at least one half of my wheat straw hauled back into the field, scarcely missing the time required for the operation; and I believe the straw thus spread upon land of this description will be much more beneficial than in any other way.

My general method of manuring, which I know is different from the usual practice, and at variance with the opinions of our most judicious farmers, is to commence manuring in the poorest spot in the field, and proceeding on in this way from spot to spot until the manure is exhausted. By this mode I have got land that would not have produced any thing, in such heart, as to be ready to receive benefit from the use of clover, and plaster —otherwise, on these spots they might have been used in vain. Again, by this mode of improving, I have generally got my fields into an uniform condition of fertility. While none is rich, it is all in such heart that I seldom sow without reaping a pretty good crop. All which is respectfully submitted to the judges, by

JOHN H. CRAVEN.

The paper marked C, referred to in the report of the judges, being Mrs. Minor's answers to the questions propounded by the judges, were withdrawn from publication by permission of the Society.

D

Answers to the questions propounded to the candidates, for the premium offered for the best cultivated, farm, by the Agricultural Society of Albemarle.

1st. There are nine hundred acres in my tract; about four hundred acres are cleared.

2d. It is divided into five fields, from sixty to one hundred acres each.

3d. The fields are cultivated regularly in corn, wheat, and clover: except that a part of the larger fields is put in tobacco; and about half the field intended for fallow, is left unploughed.

4th. The fallowing for wheat is done after harvest; about the 20th of September, the land is harrowed over, the wheat sown, and harrowed in by the first of October: when the seeding in corn land commences. This is prepared by cutting off the stalks and removing them, and running a single horse plough once, immediately in the row, which ploughs up the corn stubble. A large harrow is then run across the rows to level the surface, the wheat sown and put in with little Carey ploughs: a harrow or bush completes the operation, which, generally terminates by the last of October.

Oats are sown on corn land about the last of February and first of March; clover, a little earlier. Rye, is not cultivated.

5th. Corn, is cultivated only on clover land, which is ploughed as early after seeding wheat as practicable, harrowed over in March, and listed horizontally five feet apart. The lists are opened with a coulter, and the corn planted as early in April as practicable, four or five grains in a hill, from two to three feet apart. As soon as the corn comes up, a coulter is run twice on each side of the row; the same operation is repeated with ploughs and the corn thinned to one stalk in the hill, as soon as its size will permit. After weeding, the whole interval between the rows is ploughed once or twice, before, or immediately after harvest. In planting, and every subsequent operation, the richest parts of the field are worked first, and generally about half laid by before harvest; immediately after which, the bushes, weeds, and grass are chopped out with hoes.

6th. Wheat is sown from five pecks to two bushels per acre, thicker on more fertile land, and that seeded later in the season. On fallowed land there is some allowance made for seed not buried by the harrow. It is not the object to sow that quantity which will bring the heaviest crop of a good year, but to make the crop less liable to be injured by the fly, frost and rust, (as it will ripen earlier when sown thick,) guarding against any material injury from too thick seeding in dry years.

7th. The purple straw wheat has been found most productive. The best grain is selected for seed, and cleared of the cockle by using a sand sieve to the fan, nearly as large as the sand board.

8th. The cradle is used entirely for gathering small grain, as being much the most expeditious; particularly, where hands are unaccustomed to the sickle.

9th. At the commencement of my operations, the average product per acre, was about two and a half barrels of corn, and seven bushels of wheat. It is now, about four or five barrels of corn, and twelve bushels of wheat.

10th. There are eleven laborers on the farm, viz: seven men, three boys, and one woman: day laborers are scarcely ever employed.

11th. The number of work horses is five, and almost exclusively for the plough; of oxen, six, used for hauling with the cart or wagon. These have been all raised on the farm, and two of the work horses: also, four saddle horses of fine blood, which promise more profit than any other stock.

12th. The horses are fed on clover hay, corn and oats ground, or not, according to circumstances, and cut oats straw; oxen on the same, with top fodder or shucks, but depend principally on grazing in summer.

13th. The McCormick plough is preferred as doing the best work, of the lightest draught, easiest kept in order, and cheapest in the end. Rodes' hill side plough is used on steep land, where we cannot get around the hill, and for single horses, Carey ploughs with a long wing and no mould-board.

14th. The horned cattle are 33 in number, 6 work oxen, 5 milch cows, a bull, 20 young cattle and two horses: more than should be on the farm.

15th. Hogs and pigs on the farm amount to 60 at this time, about 25 of which are for pork this fall. They are kept on the field intended for corn all the winter, and until the corn is planted, then

turned in the woods until the clover blooms, when they are put on it, and remain until the wheat is removed from the fields, where they enjoy the advantage of gleaning until the rains in September, when they are again placed in the field intended for corn. They are fed partially with corn all the year, except when in the grain fields, and are prevented from rooting in the summer, by cutting off the ends of their noses. Of sheep the number is 43. They are kept during the early part of winter on the field intended for corn, and when they commence having lambs, removed into the standing pasture, or put on clover more than one year old, where they remain until the field intended for grazing is in bloom, when they are put into it, and removed with the other stock into the grain field. But they are not suffered on any account to remain on the young clover in the fall, winter, or early part of spring, as they would entirely destroy it by eating out the bud.

16th. The horned cattle are penned during summer on some poor spot, (if convenient) in the field to be cultivated the same, or ensuing year. The bench fences used by Mr. Rogers are certainly a great improvement: but not yet adopted.

17th. The wheat straw from about 1000 bushels of wheat, most of the corn stalks from about 250 barrels of corn, and all the other forage including about 30 tons of clover hay, are converted into manure in the stable, and permanent farm pens. The quantity has not been ascertained. Most of it is applied on tobacco land, the balance on the poor spots when ploughed for wheat, oats or corn. It is considered most judiciously used where applied to wheat or oats, for the improvement of land.

18th. My experience has confirmed the general opinion of the utility of plaster of Paris, particularly when sown on clover, in March or April about one bushel per acre, or used with seed corn in planting.

19th. From 20 to 40 tons of clover hay are cut on the farm, averaging from one to three tons, per acre. The process of curing is to suffer it to remain in swath about 24 hours, when wainrows are formed by turning two swaths together; after six or eight hours sun it is put up in very small cocks, and in a day or more is ready for the rick, which is covered with wheat straw about a foot thick, this is confined by small poles tied together at the ends, and placed across the top about three feet apart. As the clover hay will not stand wet weather in cocks, it is all important to have it secured in ricks as soon as possible. When to be used a part of the rick is cut off with a hay-knife, an instrument indispensable to every farmer.

20th. The clover seed necessary for the farm, is cut with grass scythes.

21st. No other resources have been resorted to for the improvement of the farm than those it has furnished, except two or three tons of plaster used annually.

22d. In the management of negroes, the principles have been to unite humanity with discipline, and combine rewards with punishments. The details have been entrusted to an overseer. From 70,000 to 80,000 hills of tobacco are cultivated on the farm, the greater portion on new ground

W. H. MERIWETHER.

E

I hope in this communication to embrace all he questions propounded by the committee of the Agricultural Society of Albemarle, to the candidates for the premium offered for the best cultivated arm.

I purchased the farm on which I reside in the year 1810. It had been cultivated previous to that time according to the three-shift ruinous system, and had been closely grazed, and large crops of corn yearly tended on it. These causes, each in itself destructive, had rendered some parts of the farm gullied, and a considerable portion of it besides so impoverished, as to be thrown out as unfit for cultivation. Its yield at that time was not more than about an average of three barrels of corn, and from eight to ten bushels of wheat per acre. I had then much to learn, and at once adopted the five shift system, which gives a rotation of wheat, corn, wheat, clover, clover, and pursued it for some time without the success in improvement desired. Experience taught me its disadvantages, and proved it to be a very slow way of improving, although every effort was made to raise all the manure possible, and to apply it in the most judicious way. The three successive crops of wheat, corn, wheat, produced too great exhaustion; the last wheat crop reducing the land almost back to the state it was in, previous to the turning in the clover and manure for the first wheat crop, besides the constant liability to washing on high land, arising from leaving the land after the first wheat crop, light, naked, or only covered with a thin stubble. For these reasons I abandoned it and have since adopted and pursued the six shift system, which gives the rotation of corn, wheat, clover, clover, [wheat, clover?] the improvement on this plan has been rapid, far superior to what it was with five shifts. The advantage of manures is clearly discovered and encourages to greater diligence in procuring and applying them. I now, as formerly, but more cheerfully, make all possible use of them. All the corn stalks, part of the straw, and all the other rough produce of the farm are converted into manure in my farm pens, which are situated near the barn and furnished with permanent shelters of plank, having a stream of water running through them in troughs. The area of each pen, is levelled and elevated a little on the borders, so as to retain as much of the liquid as possible. Of the quantity raised I can form no estimate. It is almost exclusively applied to the poorer spots of the field which I fallow for wheat, immediately before the land is ploughed, and very regularly distributed. I use plaster freely, a proof of the high estimation in which I hold it; sow it early in the spring at the rate of from four to five pecks per acre on clover, and roll all my seed corn with as much as can be made to adhere. With the aid of plaster, I make as much clover hay as I think necessary for the use of the farm, say from 50 to 100 tons, the balance is suffered to remain on the land to cover and improve it. The close grazing practised by many farmers is destructive of improvement and counteracts the benefit derived from plaster. How can it be otherwise, when the land after the application, yielded a generous return, has its whole crop of grass or clover either cut or grazed off—a crop which would materially benefit the land by laying on it. Indeed, I consi-

der it as well to dispense with plaster altogether, as to have its good effects destroyed by a plan so ruinous. My clover is cut when a portion of the heads commence turning brown, is cured in the usual way, and stacked in ricks thatched with straw, or put in houses. A large quantity of my straw is hauled and spread (generally on stubble fields) so thinly as not to check the growth of vegetation, and regularly on the poorest parts of the fields. This I consider to be so valuable a mode of improving, that I might be justified in using very strong terms in speaking of its importance. It forms an admirable cover for the land—it protects the young clover, encourages and fosters the growth of all kinds of vegetables. I also improve much by penning my stock on the poorest parts of my fields. The mode of penning is, I suppose somewhat new. I have poles cut and bushed of about six inches diameter and 18 or 20 feet long. In each of these, two legs are inserted on one side and three on the other, so as to form a kind of bench, four and a half feet high. On the side of three legs, laths sawed about three by one inch are nailed to the legs about a foot apart. The benches thus prepared are put end to end, three or four or more according to the number of stock penned, and placed so as to form a square, the laths nailed on, being on the outside. The area of the pen is then covered with straw. The convenience of this pen will readily be discovered, as the pens require moving every eight or ten days. Two men and a boy may easily raise the benches and alter their position in 15 or 20 minutes. If it is necessary to move them to a distance, the two legs on one side (having been put in without wedging) may easily be taken out, the benches put in a wagon and conveyed to the spot selected, when the legs may soon be replaced, and the benches set up. One of the benches is about eight feet long, so as to be more easily moved than the rest, in order to form a convenient entrance into the pen. The above mentioned rotation and use of manure, with the mode of cultivation, soon to be described, have produced all the results ascertained; some idea of which may be formed by stating that the waste land has all been reclaimed, there is not a gully or gullied spot to be seen, and a yield safely calculated on, of from six to eight barrels of corn, and from 20 to 25 bushels of wheat, per acre, on an average. Cloverton, (the farm on which I reside,) contains about 800 acres nearly all enclosed, 300 woods and 500 cleared; the cleared land is divided into six fields averaging about 80 acres each, varying a little in size—there are besides a few grass lots. The mode of cultivation is as follows—my corn is planted from the 5th to the 15th of April on clover land, not closely grazed. The preparation is made in the fall or before the winter sets in, by first laying off rows with a coulter, six feet apart, then running a coulter furrow on each side of the rows laid off, so as to have three furrows together, to be covered by a list—this should be done very deep in order to have the ground well broke; then with a large two or three horse plough a furrow is run on each side of the three coulter furrows, barely making them meet: there will then be three surfaces thrown together where the corn is to be planted, and a good portion of vegetable matter covered, which fermenting about the time the young corn gets above the ground adds materially to its vigor and growth. In the spring I cause a small harrow to be run lengthwise on the lists, which are afterwards opened with a shovel plough, and corn dropped four or five grains together, from three to three and a half feet apart. The intervals are then broken up as deep as possible with the coulter; they remain in this condition until the clover growing in them blossoms. The clover is hindered from flourishing by the coultering, and almost effectually secures the corn from destruction by the worm; that insect feeding on the clover until the corn is out of danger of its depredations. As soon as the corn is of suitable size, it is thinned to two stalks in a place, and weeded with a hoe, or sometimes a small iron rake is used soon after a furrow is run, with a two horse plough, on each side of the list, throwing the earth to the corn, and weeded with the hoe. When the clover is in bloom, as stated above, the whole of the intervals are broken up with a two horse plough, turning the clover as well under as possible. It is then run over with a cultivator or harrow: it may be necessary to run the cultivator over again just before or after harvest to keep it clean for seeding.

I have been thus particular as I think it very important that corn should be cultivated on clover, and not on stubble land. Independent of other advantages, such as prevention from washing and exhaustion, after the land has been well covered with clover and two or three crops well seeded, and turned in, there will be no more necessity of sowing. Corn land cultivated in this way will be a good preparation for a wheat crop, and will yield nearly as much as that on fallow. My time of sowing wheat is from the 20th of September, to the 15th of October. The preparation is made by breaking up the ground after harvest with a three horse plough, (the coulter is used when the ground has been rendered hard by dry weather) then harrowing, sowing the wheat, and harrowing it in, provided there be moisture enough, otherwise, ploughing it in with small ploughs. The greater part of my corn land is sown in wheat, the balance generally in rye. This is done if the ground is foul, by first breaking it up with a two horse plough and harrowing in the grain, or if not foul, by ploughing it in with the one horse plough. I sow but few oats, and those on corn land the last of February or first of March, clover seed about the same time. It may be as well to remark here that I consider the white flint and purple straw wheat most productive, and that I have always been very particular in selecting the best of the product of each crop for seed. Also, that in securing the wheat crop, I have about half of it cut with the sickle, on account of not being able to work to advantage where it is rank. Even where it is rank and standing up, my hands having been well practised, secure nearly as much in a day as they can with the cradle. The laborers employed on my farm amount to twelve men, two boys and two women, except a few small boys which render as yet but little service. I seldom ever hire, even in time of harvest, any day laborers. In addition to this force, I work six mules, four horses and eight oxen; two riding horses are also used. All the resources for its improvement, have been furnished by my farm, with the application of this force—a force which has expended a considerable portion of its time and labor in clearing up and improving a small farm purchased some years ago

on an adjacent mountain, and which is intended for a grazing farm.

To feed and clothe my laboring hands well—to keep them in good, dry and comfortable houses, warm in winter, and airy in summer—to be careful not to have them exposed in bad weather—I consider to be the dictate not only of humanity, but of the strictest economy. I hope this remark will be attended to. Working negroes in wet and very cold weather, affording them low, contracted huts argues to say nothing worse, a defective judgement, and a narrow and mistaken policy. Those who pursue this plan will find their hands in good weather confined by diseases, which have originated from exposure in bad.

I prefer mules to horses, when they can be got of good size; considering them longer lived, much hardier, and requiring much less food; particularly grain. My horses as well as mules are principally fed on clover hay for rack food; on ground rye, mixed with rye straw, or clover hay cut at all feeding times, except in the morning, with about four or five ears of corn previously soaked 24 hours in brine. The oxen in summer are chiefly fed on grass or hay; at twelve o'clock in the day, they have a good feed of chopped grain with cut straw or hay; in the winter, short corn with hay or top fodder. My sheep, about forty in number, are seldom fed, having good pasturage; about the time of yearning and when there is snow, they have some meal and blade fodder. My hogs are kept during the winter and spring in a woodland pasture until the clover blooms, when, their noses being cut, they are turned into the clover field and fed with one or two ears of corn each per day; after harvest they are turned into the grain fields, where they remain until those fields are gleaned, when they are again turned into the clover fields.

With respect to ploughs, I use the M'Cormick, Carey, and Barshare. I think them all good. I would prefer the M'Cormick, if it had more elevation in the throat, so as to avoid choaking in rank clover.

My average crops are about 3000 bushels of wheat, 500 barrels of corn, 3 or 400 bushels of rye and 4 or 5 hogsheads of tobacco. The amount of sales from my farm in 1827, was about three thousand seven hundred and fifty dollars; in 1828, four thousand five hundred dollars.

The variety of particulars necessarily embraced in this communication, has deterred me from enlarging as much on some of them as I could wish. I am unwilling to be tedious, and shall therefore refrain from giving so fully as otherwise I might, my views, even if they could be of any avail, on the advantages and disadvantages of the different shifts and rotations of crops in general use. I believe there is much to be said on this subject; I will, however add, that, having lately purchased a farm adjoining to Cloverton, containing near 300 acres a considerable part of which is cleared, I shall change to the seven shift system, believing that preferable to the six. The latter plan allowing the first clover crop to stand only one year before it is turned in for wheat; whereas the former allows it to stand two years, which ought always to be the case, and the rotation will then be corn, wheat, clover, clover, wheat, clover, clover. I know there are objections to such a number of shifts, arising from the impression of too great a portion of land lying out of cultivation; but the strictest attention and long experience have convinced me that those prejudices are ill-founded; and that taking ten or fifteen years together, independent of the improvement, much greater profits will be realized by the seven, than the six shifts. My confidence in this plan is such, that nothing now will ever induce an abandonment of it: unless the blue-grass should increase so as to injure the wheat and clover very materially.

JOHN ROGERS.

A GLANCE AT THE FARMING OF ALBEMARLE.

For the Farmers' Register.

The pressure of unexpected private business having a few days ago required my immediate presence in Albemarle, I gave the small portion of spare time afforded by so hurried a visit, to a very hasty view of some of the farms in that interesting region. Had my engagements permitted, it would have been to me both gratifying and instructive to have devoted as many days to this examination, as in fact I was able to give of hours: but my business compelled my return homeward to be as speedy, as the visit was sudden and unforeseen. Under these circumstances, it would be most prudent to refrain from offering to the public any of the imperfect impressions received during so short and hurried a view. But I am induced to take the opposite course, with the hope that the deficiencies may be excused, and (if merely to supply the evident deficiencies, and to correct my mistakes,) that some of the farmers of the South West Mountains may be induced to furnish to the Farmers' Register a better and more full account of the remarkable soil and excellent farming of that region. There is no part of Virginia which presents to the eye of a stranger such a combination of beauty, fertility, and peculiar qualities, as the range of "red land:"—and yet from all this rich and extensive district, embracing so many good farmers, and intelligent, well educated, and public spirited men, not one communication has been made to the Farmers' Register relating to the husbandry and characteristic features of this region. I hope this state of things will not be permitted to continue, and that even my humble effort will have some effect in stimulating to action those who can render in this way so much more important service.

It would have better directed my inquiries if I could have previously seen the reports of the premium farms, published in 1829, by the Agricultural Society of Albemarle:* but I could not obtain a copy until the moment of my departure homeward. It has since been read with a degree of interest much heightened by my having lately seen some of the farms described. But valuable as is this report, it has one defect, which is very generally found in all similar papers. The peculiarities of the soil, &c. are described as slightly as if every reader was previously well informed in that respect: and though the want of such details may not be felt by the residents of that region, it would serve to destroy the principal value of the report to strangers. On this account, my remarks will be principally directed to those peculiarities of

* The report referred to, is that which precedes this communication, in this No. of the Farmers' Register.

soil and of farming which most readily attract a stranger's notice, by the contrast to what he has known elsewhere—and will be either very concise, or omitted altogether, on the subjects fully explained in this report, to which I shall frequently refer.

The Southwest Mountains, form the most eastern range in Virginia, running parallel with the next, and far more elevated Blue Ridge. They form what may be termed the back bone of the body of "red land" which stretches some miles on both sides, of various widths and irregular outline, and running sometimes abruptly, and at others gradually into the "gray land," as the soils differently colored are called. The red soil seems remarkable for the very small portion of silicious sand which it contains, compared to the argillaceous part, or the pure matter of clay. Twice or thrice as much sand alone, would not prevent a soil being very close,'water holding,'adhesive when wet, and intractible and difficult to manage both when wet and dry. But the red clay soil of Albemarle, is (for a *clay* soil) remarkable for its being permeable by rain, produces fine corn, (a crop to which stiff soils are so unfriendly,) and is not difficult to plough, if taken in a proper state as to moisture. Nor is this state rare—for the soil absorbs rain, and permits its evaporation, so readily, that it soon becomes fit for the plough after a thorough wetting. The subsoil differs very little in appearance from the upper soil, where ditches or gullies permitted it to be seen several feet below the surface. But though there seems to be so little of silicious sand in this soil, (judging altogether by appearances,) there are other ingredients which serve a better purpose in keeping the soil open. These are argillaceous gravel, and small particles of soft iron ore, or particles of earth combined with iron in some form, and forming in size and texture a sort of gravel in small and soft lumps. In a recently ploughed corn field of Mr. John Rogers' on which a heavy rain had lately fallen and swept the surface considerably, I observed in every little depression many round particles, which appeared in size and form like small shot coated with red clay. These were the particles of iron earth which, when mashed, were found to be black, or very dark within. It is the decomposition of the rocks containing iron which give to the soil its brilliant deep red color. To lowlanders, this redness of the soil at first appears as an indication of actual or approaching sterility, because their surface soil is never red, and the subsoil which is so, (though never so red as the land of Albemarle,) is made visible by being washed into galls and gullies, and is quite barren. For this reason, a visiter who first sees this land will generally underrate its worth. The whole ploughed surface of a hill-side appears like a bare and barren red gall—and there are plenty of gullies on the steep lands which have been managed injudiciously, to add to this unfavorable impression of the slight observer. Besides. the main road is generally on the lower land, and the traveller looks upwards at the fields which are on the sloping hills on each side—and this exposes every gulley to full view, and keeps concealed the great extent of rich land. But much as this hilly land has been caused to wash and gulley by careless management, no where is this loss of soil more easily and profitably repaired. From the ease with which naked washed galls and deep gullies have been converted to rich soil, by vegetable matter, clover and gypsum, as well as from the similarity of appearance and texture, it would seem that in fact there was not much difference between the soil at the surface, and at the depth of some feet. All this red land was naturally rich and the mountains to their summits are as rich as the lower and more gentle slopes. Still however, their steepness near the tops, and the increasing quantity of stone scattered over the surface, render the mountain summits less profitable for tillage; and the greater part remain under their original growth of trees. Nor can the mountain steeps be made as profitable for grazing, as their richness would indicate, and as would be the case if the soil was limestone, or calcareous. The red soil is not friendly to grass in general; and in dry seasons, stock on the mountains would suffer for water as well as for grass. The adaptation of the soil to clover, which might be deemed a contradiction to this assertion, seems to be caused by gypsum, and the peculiar fitness of the soil for the action of that manure.

But rich as were the red lands originally, their general steepness, aided by tobacco culture, shallow and bad ploughing, &c. had caused a general and great deterioration of the old cleared lands, by exhausting, and still more by washing away the soil. The same system, if persevered in as long as similar causes were pursued in the low country, would have ruined these lands, if they were capable of being ruined. Fortunately, some judicious agriculturists commenced a reformation which has gradually extended through this neighborhood; and wherever it has operated fully, has served to restore richness to the surface, and to exhibit the most beautiful country that I have ever seen. The use of clover and gypsum is the main, indeed almost the sole means for this renovation—for without them, the benefits of collected manures and improved tillage would avail but little. Deep ploughing and coultering, (which seem to be universally approved, if not universally practiced,) and the use of horizontal rows for tillage, have checked the disposition of the soil to wash, and the old gullies have disappeared on the most improved farms.

As may be supposed of lands which form the slopes of a range of mountains, the red lands are generally hilly: but there are also many extensive levels through which small streams flow, and which have almost the appearance of alluvial flats, in comparison to the surrounding hills. These pieces are at least as level as any one would desire, and more productive on the average of seasons, than the richer but less safe James River low grounds. The hilliness of the surface generally, however objectionable for cultivation, adds greatly to the beauty of the landscape. Except the mountain tops, the country is generally cleared: and from an elevated position, the observer has within view a wide sweep of hill and valley, alike covered with rich crops of clover and corn, or fields now studded thickly with wheat shocks, showing an abundant harvest. The beauty and richness of the landscape more than compensate for the total absence of the sublimity and grandeur which characterize the scenery of more rugged and elevated mountains.

So much for general remark. My more particular observations (if any deserve that name) were

mostly confined to the farm of Mr. John Rogers, and a still more hasty glance at those of some of his neighbors.

I had believed from the opinions and experience of several improving farmers presented heretofore in the Farmers' Register, that wherever gypsum acted, and produced heavy crops of clover, the great means to secure the profit to the land and to its proprietor's purse, was to turn in the green clover as a manure for a succeeding crop of wheat. This was the practice here to great extent but a few years ago. But it only obtained with Mr. Rogers for one crop of wheat in his six-field rotation, in 1828, and previously, [see Report, page 231] his other crop of wheat then succeeding corn: and now he has abandoned not only his clover lay for wheat, but has adopted the four-field rotation of corn, wheat, clover, clover. This is for his Cloverton farm, and may be considered his regular system: but he has several other fields on and near the mountain top, which he cultivates as circumstances require, and under no regular and fixed rotation. It added to my surprise, while it served to confirm the correctness of the change, to hear that other good farmers in the county were changing or intended to change to this four-shift rotation, from the six-field, which has been general—viz: 1 corn—2 wheat—3 clover—4 clover—5 wheat—6 clover. The reason given was that the blue-grass increased rapidly with this rotation, and that the fifth crop, wheat, was often rendered very unproductive on account of the blue-grass becoming fixed in the clover of the previous year, and which was scarcely hurt by the usual fallow process for the clover. Another reason was, that it was found too laborious to plough under for wheat every summer and autumn one-sixth of the farm. It is considered by Mr. R. a great sacrifice of fertility to plough under clover the second year after it comes up (on the year succeeding the wheat crop) compared to letting the land have the benefit of its growth for a year longer—he does not consider the manuring by clover as less beneficial when turned in dry in the winter, for a succeeding corn crop, than when ploughed in green for wheat. The clover (notwithstanding the increase of blue-grass) is a heavy growth on the third as well as on the second year after being sown. This prevents the objection to its continuance which would generally be found in the lower country, even where good clover grows, viz. that the clover is so inferior in the third year, and has been so much eaten out by weeds, as scarcely to deserve the name of a "clover lay," for the benefit of the next crop of grain. The farmers here think that their lands could not stand the more severe cropping of Mr. Carter, Mr. Selden, and others, of three grain and one clover crop in four years, and of course, the clover turned in for wheat before it is two years old. But Mr. Carter and Mr. Rogers have each means for improvement which the other has not, or which are used to less extent. If the former takes three grain crops in four years, he also gives all his clover to the land (neither grazing nor mowing to any extent) and has all the offal of his corn crop from his embanked marsh, to increase his manure. Mr. Rogers makes and applies much manure, but less probably than the other, because he can manure so much more cheaply and effectually by giving clover plaster, and another year of the grass part of his rotation. But his clover is not all given to the land. He mows largely for hay and for seed, and also grazes for a short time after summer is over, and when the clover is to be ploughed in. This grazing is found serviceable to break down the heavy cover, and permit the ploughs to operate more effectually; and it is not thought to retard the improvement of the soil.

The mode of cultivation of corn described in the report of Mr. Rogers [page 231] which leaves the clover to stand until in bloom, then to be ploughed in, has been found in practice to be attended with hazard. If the land becomes very dry before the clover is turned in, it cannot be done well, nor the soil be well broken, and the crop is greatly injured. Under more favorable circumstances the success was complete.

The clover was good on every part of Mr. Rogers' fields, and generally as luxuriant as I ever saw any where, except on spots very highly enriched with putrescent manures and gypsum. Such a cover he expects to be followed by a crop of corn equal to thirty-five bushels the acre, or 30 of wheat, on the best land. The land concerning which this opinion was expressed, in answer to my inquiries, was so high up the mountain that it is not likely that it had received any manure except plaster and clover—though that inquiry was not made.

It is a general practice in this neighborhood to apply the wheat straw dry and unrotted, and often fresh from the thrashing machines, as a top-dressing for the poorest parts of the clover land. It is not laid so thick as to kill the grass, and aids its growth and the fertility of the land so much, that a load of straw used in this manner, is thought much more beneficial than if it had been passed through the farm yard, in any of the usual processes of making manure. On the farm described in the report as William H. Meriwether's, (since sold to William L. Craven) I saw a piece of land thus covered with straw, from which oats, and evidently a very good growth, had been lately reaped. Yet this growth was caused by this dry top-dressing applied after covering in the seed, and of course late, on a spot so worn as to have been otherwise very unproductive. This is certainly a very cheap mode of applying the straw, independent of its alleged (and universally admitted) superior efficacy.

There is always found one striking exception to the general natural fertility of the mountains. All the ridges and points exposed to the force of the north west winds, are comparatively poor, which is supposed to have been caused by the leaves having been always blown off by the violent winds from that quarter. The east winds are generally accompanied by rain, and the leaves being wet are not carried off.

The culture of tobacco, formerly the principal object of every farm, and still so on many, has almost disappeared on the most improved and improving farms. It is considered that the constant and unremitting attention required throughout the year, by a full crop of tobacco, leaves no time and labor for the effectual improvement of the soil. My experience of the cotton crop, which also occupies nearly as much of the year, disposes me to admit the force of this objection to tobacco. It is the *leisure time* of the farmer judiciously used, that is most profitable to his land and ultimately to his income—and of leisure time, a full crop of

cotton permits but little during the year, and one of tobacco, none at all.

There is very little fixed rock showing on the surface of the mountain land, and not much of loose rock on the lower slopes. Where it is sufficiently abundant, it is profitably used to make dry stone walls for fences, which are far better than any of dead timber, or live hedges, estimating both cheapness and durability. Most of these are built by the ordinary laborers of the farm. The most extensive work of this kind, is along the main road which runs on the margin of the Rivanna River, and bounds the highly improved farm of T. J. Randolph, esq. for one and a half miles or more. This was built principally of stone quarried for the purpose—and perhaps the location alone justified the expense—as a boundary line formed by a public road passing alongside to a navigable river, cannot be altered by any operation of our laws directing the division of lands, which in most cases forbid permanent and costly modes of enclosure. The best constructed stone fence seen, (for which a regular stone mason was employed,) is on the farm of Professor Davis, of the University of Virginia.

The red lands are very favorable to the growth of locust. A few acres of suitable steep mountain side when thrown out of cultivation for this purpose, will soon be covered with this rapidly growing tree, and in ten or twelve years furnish posts of the most durable of all timber for fencing. Mr. Rogers showed me locust nurseries for this purpose, which require nothing, except to be let alone until the largest trees are fit to be cut and removed for use. Of course there will be an endless succession of the timber. He does not permit locust trees to stand singly in his fields, on account of the great trouble caused by suckers springing from the roots. For shade for stock, he prefers the black gum, which strikes down with a perpendicular root, and does no harm whatever to crops growing beneath. The high and steep calcareous banks of the lower James River, are as favorable to the growth of locust as any land in the world, and would be more profitably used for that purpose than any other. They are of but little profit for tillage from their steepness, and the continual labor required to keep down the growth of locust. Where our river banks have never been cleared however, the locust forms but a small portion of their cover: and it will be necessary to cut down all other trees, and perhaps to dig the soil and cut the locust roots, to cause the latter growth to take possession of the whole surface.

Gypsum is sown on the clover in every course of the rotation, if it is in the farmers power—though the scantiness and irregularity of the supply heretofore, have caused the use to be more limited on every farm than was desirable to those proprietors who properly estimated the value of this manure. Mr. Rogers thinks that he finds its power diminished on fields where it has been repeatedly applied—but not so much as to make the continued application unprofitable.

Lime has not been used in this particular neighborhood except in small experiments, of which I only heard generally that the results were satisfactory. Some miles eastward of, and parallel with, the range of the South West Mountains, runs the narrow strip of limestone of which so little use has been made either for cement or manure. Some however are profiting by this treasure. A quarry is opened on the farm of Professor Blættermann, and from it he has already limed most of his land. Its appearance compared with the adjacent unlimed land of his neighbor, (the fields lying on each side of the main road to Richmond,) offers strong testimony of the benefit derived, even to the eye of a passing stage coach traveller, as I was.

The hill-side plough is very little used here, though its peculiar advantages would be no where better obtained. The reasons stated for its disuse, were the liability of this plough to be put out of order by awkward or negligent ploughmen, and that its object (the turning of the furrow slices downhill,) was nearly as well secured by the manner of using the common ploughs in breaking up land, which is to plough around each hill and knoll. When a hill rises on every side, in form somewhat like an obtuse cone, the plough may in this manner begin at the base, and by going around, plough the whole hill, throwing every furrow downward. But this convenient form of the surface is not often met with. The mountain slopes are more generally in the form of parallel knolls or broad ridges, separated by narrow depressions (or hollows) which runs up the mountain until they are gradually lost. By the plough taking the whole of one of these knolls in a single land, (even though it be thirty or forty acres in size,) and descending one of these narrow depressions and ascending another, the whole piece may be ploughed with perhaps three-fourths of all the furrow slices thrown downward. But the remaining part, where the plough crosses the ridge, the slices must be thrown upward, and, of course, the work imperfectly executed. If this crossing place is the boundary of the field, or the most suitable place for the ploughing always to cross, every repetition of the operation, will serve to increase the difficulty for the next, by increasing the steepness where the slices are thrown uphill. Besides—though these depressions form small lateral hill-sides very suitable for throwing down the slices, whether the plough is ascending or descending the general slope of the mountain, still the ascent is generally sufficient to make the labor of the ascending furrows very heavy. The great extent and irregular outlines of the lands so laid off, must also be very inconvenient, as a little work is spread along a great length, in furrows as crooked as the outlines, and necessarily passing through soils different in texture, exposure and degree of moisture, which would work better at different times and separate operations. All these objections may be cheaply avoided by the hill-side plough if I may form an opinion from my limited experience of that implement—and I have not yet found that it is very subject to be put out of order. Mine were bought of Sinclair & Moore, Baltimore, at $10, and differ perhaps from such as are made and used in Albemarle. The hill-side plough is certainly more costly than others, and requires some little trouble to shift the mould-board: but both these objections are more than compensated by the greater ease and rapidity of the work, and its better execution, caused by every furrow being thrown down hill—besides its great effect in preventing the washing of hill-sides, by having no furrows to run in the same direction as the water from heavy rains run down the descents.

It was still more surprising to find that the mode of horizontal ploughing introduced here by the late Gov. T. M. Randolph, was no longer practiced. Another mode of horizontal ploughing, which though less scientific and accurate and far less laboirous, is much better, is in general use in Albemarle—and it is also practiced by many in the lower country, who had tried and abandoned the more theoretically perfect plan. But though the same name is used for both practices, the same general direction of the rows given, and the same object aimed at, still the principle of the one is essentially different from that of the other. I do not remember whether the distinguished agriculturist who introduced this plan, published a particular description of the process—though I presume so, as he received the honorable and well deserved reward of a piece of plate from the Albemarle Agricultural Society, for the benefits which he had by this means conferred on his country. But according to the idea formed of his plan from the reference to it in Arator, and elsewhere, the *principle* of Col. Randolph's plan seemed to be, to plough the hill-sides in beds and water-furrows, so levelled as to retain in the furrows all the rain water that fell, and thus prevent washing. The author of Arator says hilly lands "will admit of narrow ridges as well as level, by a degree of skill and attention so easily attainable that I observed it to have existed in Scotland above a century past, under a state of agriculture otherwise execrable, and among the ignorant highlanders. It is effected by carrying the ridges horizontally in such inflections as the hillyness of the ground may require, curved or zig-zag, preserving their breadth. The preservation of the soil is hardly more valuable than that of the rain water in the successive reservoirs thus produced to refresh the thirsty hill sides, instead of its rushing to, and poisoning the valleys. This classick system of agriculture has been introduced into Virginia by a gentleman of Albemarle, in a style completely adapted to the nature of the country, and which will be copied by those who shall not be discouraged by its perfection. His ridges however are wide, whereas in the maize country, they ought not to exceed five or six feet." Eighteen years ago, according to these, and to more full and minute directions furnished in the publications of that time, I ploughed the slopes of my sandy field into horizontal beds for corn, with great care, and met with total failure, and the land washed more than it would have done otherwise. The causes of this failure were sufficiently apparent—and I attributed it to the unfitness of the plan for the sandy slopes descending from level table land, however advantageous it might be (and which I did not doubt,) on clay or stiff hill-sides, having no table land above to collect and discharge torrents of rain water over them. But the practice of the original and more perfect horizontal beds and furrows has also ceased in Albemarle, and that which is called by the same name is precisely the practice which the failure of the other compelled me and many others to adopt, and which is so simple, that (like the breaking of Columbus' egg,) it would seem that it would have occurred to every cultivator of hilly lands, without any particular one discovering or introducing it. Still I doubt not that we owe the benefit of this practice to the introduction, and trial of, and objections found to the other: and in drawing the distinction between the plans, it is far from my design to detract from the merit of the distinguished farmer who in this, and other respects, so much aided the first improvements of agriculture in this region. Still however, it is of some importance to state the change in the operation and principle of what continues to be called horizontal ploughing, and which change is not generally known abroad to have taken place at all. The present simple plan is to break up the land level, or *flush*, and to mark off the rows for corn across the descent of the hill—not with much regard to accurate levelling, but approaching a horizontal direction so near, that the course of the running rain water shall not follow, but cross the tracks of the ploughs in tilling the crops. It is not intended to obstruct the passage of the flowing rain water—but to give it a free course across the direction of the ploughing. Mould-board ploughs are used for part of the tillage of corn: but as they are but little used, and the crop is planted on a flat surface, there are no ridges raised high enough to alter the downward course of the water, or to make dikes to be broken and swept away. This mode does not prevent washing, but greatly lessens the danger, by giving no facility for the formation of gullies. The original mode so long as it operates effectually, prevents the descent and of course the washing of rain water: but if it should ever fail, from any cause, to prevent its descent, the damage caused will be greatly increased by the very means used to guard against it.

These objections however to the original mode of horizontal ploughing are such as occurred to my mind, and were not urged by any of the persons with whom I conversed. Indeed, I have no reason to deny that the practical operation would not be perfect on these lands, if the execution of the plan was in all respects conformable to the theory. But the practical difficulties generally forbid this perfect execution—and these difficulties have caused its disuse. The main objection seemed to be that the permanency of the levelling and rows (an essential part of the original plan) would prevent the breaking up the field by ploughing around the hills, as described above: and in addition, it is preferred to lay the surface level for the crop of wheat.

The plan of hill-side ditches, or graduated trenches, to prevent washing, which has been described by Mr. Bruce and others in the Farmers' Register, has not been adopted in this region. This plan seems to me, from reason and some little experience of its operation, to be by far the best for this end—and it would suit well with the present mode of horizontal tillage. It would however require the adoption of the hill-side plough to break up the intervals advantageously.

There are other distinguished and successful improving farmers in the same neighborhood, whose names I have not mentioned because their farms were either not seen at all, or too slightly glanced at to obtain more than general ideas. There may be as good farmers—possibly better—among those, than the one whose labors occupied most of my attention. But even those persons will readily admit the propriety of placing Mr. Rogers at the head of the list of the distinguished farmers of Albemarle, as one of the first who commenced the course of improvement, and for

his success in the pursuit. He has been, from youth to old age, always a practical farmer, dependent altogether on such labors for his support and income—yet remarkable for his freedom from the prejudices which fetter the judgement and obstruct the improvement of most of those who are called practical farmers. He is said to have been throughout his life an *experimenter*—but a judicious one—always making changes in his practice, but seldom changing for the worse. He commenced life poor, and is now rich—and his wealth confers on him the only distinction which it ought ever to give to any man, and the one which any may well be proud of—that it has been acquired altogether by his own labor, skill and intelligence, and that its acquisition has been no less a benefit to his country, than to himself.

A GLEANER.

July 26th, 1834.

EFFECTS OF DARKNESS IN PRODUCING DEFORMITIES.

There is at present in Paris an artist of the Louvre, an eminent historical painter, of the name of Ducornet, who paints with his feet. He was born without arms, of poor parents, at Lille. There are also about the French metropolis a number of beggars, twelve or thirteen of them at least, all deformed in various ways, and all born at Lille, in certain dark caverns under the fortifications. The effect of these places, from their want of light producing malformed births, is so notorious, that the magistrates of Lille have issued strict orders to prohibit the poor from taking up their abode in them. It is added by the writer, that he had a conversation with Mr. Edwards on the subject, and that gentleman was greatly struck with the confirmation which the above circumstances afford to his views, stated in his work, *Sur l'influence des agens physiques sur la vie.* Mr. Edwards's experiments of detaining tadpoles in darkness, and thus causing them to grow into gigantic and monstrous *tadpoles*, instead of being transformed into frogs, are well known.—*London Medical Gazette, September*, 1832.

COAL TAR.—INFLUENCE OF THE FARMERS' REGISTER.

To the Editor of the Farmers' Register.

King and Queen, 19th July, 1834.

In consequence of the recommendation of a writer in the Register, I lately bought a hogshead containing 120 gallons of gas tar, which cost me ten dollars on board the steam boat at Baltimore. Before using it I was advised by the manufacturer to simmer it moderately over a slow fire for a few minutes, to drive off some volatile substance which it contained, by which it would be rendered better for painting. Just as I was about to commence applying it, a few days ago, I received a message from a friend to dissuade me from its use; saying that he had been informed it answered very well for preserving timber in water, but that it would ruin the roofs of houses, &c. This information induced me to suspend my operations with it, except on a granary, until I could hear more about it. Can you give me any information on the subject? It has a very pungent acid taste, and likewise a taste resembling tar, and may contain sulphuric acid.

I presume it affords encouragement to editors as well as other professional gentlemen, to hear of the high approbation of their patrons in the various quarters to which their labors are extended. It affords me great pleasure to inform you that in a visit recently to the Eastern Shore of Maryland, I was pleased to find that the high estimation in which your Register is held universally in this section of the country is fully equalled there. One gentleman particularly who has fully adopted your views, in practice at least, to the most astonishing improvement of his farm, declared that he would not have taken $100 for the first No. of the Register, in connection with your work upon calcareous manures. Your labors are exerting an influence in every part of the country bordering upon the Atlantic. Numbers who have never heard of your name, are nevertheless every year reaping a rich reward from your labors.

I was requested by Mr. * * * * * * (a stranger whom I accidentally fell in with on board a steam boat) to request you to send him the Farmers' Register, at Centreville, Queen Ann's county, Maryland. The finest field of corn that I saw in Maryland, was on that gentleman's farm, which I was informed but a few years ago was one of the poorest in the neighborhood, but which has been brought to its present state of fertility by the use of marl, sea ore, &c.

C. B. F——.

EXTRAORDINARY CALF.

A bull calf five weeks and three days old, bred and fed by C. H. Bolton, Esq. of Campden, was lately slaughtered by Mr. John Booker, of that place; it weighed 135 lbs., and was considered to be by far the fattest and heaviest calf of its age ever killed there. Its live weight on the 4th of March, was 218 lbs.; ditto on the 25th January, 100 lbs.; increase in 38 days 118 lbs. This calf in common with the rest of Mr. Bolton's stock, the offspring of a cross between the Durham and Devon breeds, which cross Mr. Bolton adopted some years back by using a bull from the stock of the Rev. Henry Berry, with Devon cows; the result of this cross has proved most satisfactory, both as to their grazing and milking qualities. This calf, up to the day he was killed, was never able to take all his dam's milk, who gives daily upwards of 16 quarts of milk of a very superior quality. The calf sold for £4.—*British Farmer's Magazine.*

BIBLIOMANIA.

From Waldie's Journal of Belles Lettres.

The Duke of Devonshire purchased some time since a splendid copy of a book, entitled "Briefe and true report of Virginia; discovered by Sir Richard Grenville, knight, in the year 1585, made in English by Thomas Hariot, servant to Sir Walter Raleigh." It was printed in 1590, and cost the princely purchaser *two thousand dollars.* It is the only perfect copy which Mr. Grenville, from whom it was brought, had ever heard of. It is possible some of the old family mansions in Virginia, where there are many bibliographical curiosities, may possess a copy. If so, it would be well to turn it to account.

COLLEGE OF WILLIAM AND MARY.

At the late meeting of the Visitors of William and Mary College, the vacant Professorship of Law was filled by the appointment of Judge N. B Tucker. The law lectures will now be extended to the full length of the general scientific course, which had been prevented heretofore by the circumstance of the Law Professorship being always held by an acting judge of the General Court, whose other duties made it necessary to reduce the time of delivering his lectures to about five months. This limitation greatly impaired the value of that professorship—and the change offers advantages to young men who wish to receive scientific instruction in general, as well as to attend law lectures, which the institution has never before offered, and which it is believed are equal, considered in every aspect, to what are to be found any where else.

The vacancy in the Mathematical Chair had previously been filled by the appointment of Robert Saunders, Esq. This is not an occasion to discuss the causes of these vacancies having been previously permitted to remain, nor to trace the injurious effects of this neglect of the Board of Visitors on the prosperity of the College. It is enough here to say that the College is now fully and *ably* supplied with professors, that its funds are in good and improving condition—and that steps have been taken and are in progress, which the friends of William and Mary hope will restore the institution to the high reputation which it has enjoyed, and deserved, and to the state of extended usefulness which it is capable of maintaining.

Political Economy, (the statesman's science, of which he who is uninformed ought to be ashamed to aspire either to legislate or to govern,) has long been an object of peculiar care at William and Mary. That Virginia has been the firm and resolute opposer of protecting duties, and monopoly in trade, and that we may now hope to be ultimately freed from the fetters of the restrictive system, and from the ignorant prejudices which forged them, is in no small degree owing to the light that has unceasingly been shed by this school on those who afterwards formed a large proportion of the distinguished statesmen and legislators of our country. The want of proper instruction in this subject alone, has permitted so far the reign of those false doctrines of national economy, which during their continuance have been a far heavier tax, than all the private and public expenses of education in all our colleges.

We consider our public institutions for the instruction of youth as among the first and most valuable of *internal improvements*, and heartily rejoice at the success of each and of all, without the slightest disposition to exalt any one, by the depression of another. Especially do we rejoice in the present unprecedented prosperity of our principal institution of learning, the University of Virginia. But there are enough youths in Virginia who want a liberal education, and whose parents are able to pay the cost, to furnish students for every college—and the low country alone (if sectional lines must thus be drawn) is well able to sustain William and Mary: and this institution was never in a better state to confer the benefits of education than it will be during the ensuing course. Nor is there any reason to anticipate a falling off from this condition. The main causes for the decline of William and Mary, it is hoped, are at an end. Its interests will no longer suffer from the neglect of a majority of its Visitors and Governors, nor from the discordant views which have unhappily been entertained and acted upon by the most zealous friends of the institution: and all now concurring in sentiment and zeal to promote its prosperity and restore its usefulness, we cannot but anticipate results corresponding to such operating causes.

A SUGGESTION—THE PINE TIMBER BUG—TOBACCO PLANT BEDS—CROWS—SASSAFRAS.

To the Editor of the Farmers' Register.

Granville, N. C. July 17, 1834.

Enclosed you will find five dollars, my subscription for the current volume of the Farmers' Register. Accept with it a farmer's thanks for the advantage already reaped from its publication. and his warmest wishes for its increased usefulness and consequent favor with an intelligent public.

By way of rendering my mite towards effecting these objects, I will offer the following suggestion, which I think if adopted, will prove serviceable to very many of your subscribers. It is that you should devise and affix to communications from correspondents recommending any thing or any plan, certain marks or symbols by which we may understand your own individual opinion of the thing or scheme recommended. It is but too true that very many things and plans are advocated with a great degree of confidence and plausibility, which, when adopted, prove seriously hurtful to the credulous and inexperienced farmer. Your own character as an enlightened and successful agriculturist is known I presume to most, if not all of your subscribers; and the adoption of this method, which will add scarcely any thing to your labor as an editor, will give us the advantage of all the valuable experience you have acquired. It will enable you to act without labor or trouble, as the special guardian of each of your inexperienced subscribers. I know no post or station in society more honorable or useful than this.*

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* The plan proposed by our correspondent, or any other for the same object, would be found very objectionable. In the first place he attaches far too much value to the opinions and judgement of the editor as a farmer—and even if this error did not exist, no editor ought to be permitted thus to pass so hasty a sentence on every piece which he publisfied. Such decisions would (even under the most favorable circumstances) serve to check that freedom of discussion which an agricultural journal ought to maintain, and besides, would be so often erroneous, as to impede, rather than advance the developement of sound doctrines and valuable facts—and would soon bring the self-constituted judge and his decisions into deserved contempt.

The same view bears, though not to the same extent, on the republication of selected articles, the soundness of the opinions and the truth of the statements of which we have been considered by some of our readers as endorsing, unless accompanied by some mark of editorial dissent. We deny the correctness of this in-

Your Orange correspondent is mistaken in supposing that it is a worm which proves so destructive to pine timber. The mischief is done by a small black bug about the size of the smallest kind of field pea. It is possible, but I hardly think true, that the bug is the parent of the worm alluded to by your correspondent. The latter is often found more than an inch long. I have never seen it in the living timber, but always in the dead. I discovered the black bug by cutting through the bark at the holes perforated by them in the living pines. They kill the tree by eating away the tender inner rind of the bark.

There is an error I think in the plan advised by Mr. Edmunds, of Charlotte, in a former number of the Register, for raising tobacco plants, which ought to be corrected, especially as Mr. E. is known to be one of the very best planters in Virginia. He recommends that the plant-bed should be grubbed before burning. I am sure the better plan is to cut down the small bushes close to the ground with an axe, and grub after burning. By grubbing in the first instance, you necessarily cover a great many grass seeds with earth so deep that the fire will not kill them. These are, by the hoeing necessary to prepare the bed for sowing, brought near to the surface, and vegetate as soon, or sooner than the tobacco seed, proving very hurtful to the young plants, and difficult to be eradicated.

If arsenic will destroy crows I know an easy plan of administering it to them. It is to bait them with corn and crumbs of bread at some place where they resort, until they go to it in numbers; and then dissolving as much arsenic in water as may be thought sufficient, mix it with meal, bake or dry it by the fire, break in small pieces, and place them at the bait. The crows will eat it without hesitation, as soon as they alight. To make them find and go to the bait early, it is best to scatter some new white corn cobs at the spot. If the spot selected for baiting is situated so that mischief may be done by other animals than crows eating the poisoned bread, it will be best to conceal some person near the bait who may hinder the access to it of any thing besides the crows. I adopted the plan the past spring, and the poisoned bread was greedily eaten by the crows. I found no dead ones, but my farm which had been previously much infested, was quickly cleared of all but a few which I am persuaded did not eat the poison.

It has occurred to me that the best means of extirpating sassafras would be to bore a hole with an auger into the tree and deposite in it some substance which mixed with the circulating sap would destroy the vitality of the roots, as well as the upper part of the tree. Will you, or some of your subscribers, inform me what substance is likely to have this effect? I have without success tried digging them up at all seasons of the year; and I know that stock will not browse on them enough to kill them, unless in the absence of all better and more favorite food. There have been kept in one of my fields during the whole of the present year more than one hundred sheep, sixty or seventy hogs, twenty-three milch cows and work oxen, besides colts and horses, without killing (as far as I have seen) a single sassafras bush. I would willingly pay five per cent. on the cost of my land to have this pest entirely destroyed.

W. O. G———.

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ference, and protest against the propriety of such a rule being applied. In presenting to the readers of the Farmers' Register the selections made from other publications, it is designed to take whatever may be most valuable—not in the opinion of one individual alone—but what may be so in the opinion of any other, whose judgement deserves to be respected. Many matters of opinion or of fact, contained in these selections, may (and often do) appear to us as mistaken or false—but it would be uncalled for and ridiculous in every such case to be presenting our opinions, instead of leaving readers to think and decide for themselves. Besides—in selecting from the latest publications, and from very remote countries, there are many statements which are either so novel, or so dependent on testimony not within our reach, that no mature opinion can be at once made up; and any other would be improper to offer. Yet to withhold these novelties from our readers because their value is doubtful, would be to keep them in the dark as to the progress of agricultural discovery and improvement. In agricultural science, as in all others, it is proper that all opinions and practices which engage attention in a considerable degree should be made known, and the true will prevail, and the false be disproved, or soon forgotten.

MR. BABBAGE'S CALCULATING MACHINE.

The following details will be read with considerable interest; more especially as they set at rest the attempts which have been made in some quarters to depreciate one of the greatest projects of the age.

The Calculating Machine described by Sir David Brewster.—Of all the machines which have been constructed in modern times, the calculating machine is doubtless the most extraordinary. Pieces of mechanism for performing particular arithmetical operations have been long ago constructed, but these bear no comparison either in ingenuity or in magnitude to the grand design conceived and nearly executed by Mr. Babbage. Great as the power of mechanism is known to be, yet we venture to say that many of the most intelligent of our readers will scarcely admit it to be possible that astronomical and navigation tables can be accurately computed by machinery; that the machine can itself correct the errors which it may commit; and that the results of its calculations, when absolutely free from error, can be printed off, without the aid of human hands, or the operation of human intelligence. All this, however, Mr. Babbage's machine can do; and as I have had the advantage of seeing it actually calculate, and of studying its construction with Mr. Babbage himself, I am able to make the above statement on personal observation. The calculating machine now constructing under the superintendence of the inventor has been executed at the expense of the British government, and is of course their property. It consists essentially of two parts, a calculating part, and a printing part, both of which are necessary to the fulfilment of Mr. Babbage's views, for the whole advantage would be lost if the computations made by the machine were copied by human hands and

transferred to types by the common process. The greater part of the calculating machinery is already constructed, and exhibits workmanship of such extraordinary skill and beauty that nothing approaching to it has been witnessed. In order to execute it, particularly those parts of the apparatus which are dissimilar to any used in ordinary mechanical constructions, tools and machinery of great expense and complexity have been invented and constructed; and in many instances contrivances of singular ingenuity have been resorted to, which cannot fail to prove extensively useful in various branches of the mechanical arts.

The drawings of this machinery, which form a large part of the work, and on which all the contrivance has been bestowed, and all the alterations made, cover upwards of 400 square feet of surface, and are executed with extraordinary care and precision.

In so complex a piece of mechanism, in which interrupted motions are propagated simultaneously along a great variety of trains of mechanism, it might have been supposed that obstructions would arise, or even incompatibilities occur, from the impracticability of foreseeing all the possible combinations of the parts; but this doubt has been entirely removed by the constant employment of a system of mechanical notation invented by Mr. Babbage, which places distinctly in view, at every instant, the progress of motion through all the parts of this or any other machine, and by writing down in tables the times required for all the movements, this method renders it easy to avoid all risk of two opposite actions arriving at the same instant at any part of the engine.

In the printing part of the machine less progress has been made in the actual execution than in the calculating part. The cause of this is the greater difficulty of its contrivance, not for transferring the computations from the calculating part to the copper or other plate destined to receive it, but for giving to the plate itself that number and variety of movements which the forms adopted in printed tables may call for in practice.

The practical object of the calculating engine is to compute and print a great variety and extent of astronomical and navigation tables, which could not be done without enormous intellectual and manual labor, and which, even if executed by such labor, could not be calculated with the requisite accuracy. Mathematicians, astronomers, and navigators do not require to be informed of the real value of such tables; but it may be proper to state, for the information of others, that 17 large folio volumes of logarithmic tables alone were calculated at an enormous expense by the French government; and that the British government regarded these tables to be of such national value that they proposed to the French Board of Longitude, to print an abridgement of them at the joint expense of the two nations, and offered to advance £5,000 for that purpose. Besides logarithmic tables, Mr. Babbage's machine will calculate tables of the powers and products of numbers, and all astronomical tables for determining the position of the sun, moon, and planets; and the same mechanical principles have enabled him to integrate enumerable equations of finite differences, —that is, when the equation of difference is given, he can, by setting an engine, produce at the end of a given time any distant term which may be required, or any succession of terms commencing at a distant point.

Beside the cheapness and celerity with which this machine will perform its work, the absolute accuracy of the printed results deserves especial notice. By peculiar contrivances, any small error produced by accidental dust, or by any slight inaccuracy in one of the wheels, is corrected as soon as it is transmitted to the next, and this is done in such a manner as effectually to prevent any accumulation of small errors from producing an erroneous figure in the result.

In order to convey some idea of this stupendous undertaking, we may mention the effects produced by a small trial engine constructed by the inventor, and by which he computed the following table from the formula $x2$ by x by 41. The figures, as they were calculated by the machine, were not exhibited to the eye as in sliding rules and similar instruments, but were actually presented to the eye on two opposite sides of the machine, the number 383, for example, appearing in figures before the person employed in copying.

Table calculated by a small trial engine.

41	131	383	797	1373
43	151	421	853	1447
47	173	461	911	1523
53	197	583	971	1601
61	223	547	1033	1681
71	251	593	1097	1763
83	281	641	1163	1847
97	313	691	1231	1933
113	347	743	1301	2021

While the machine was occupied in calculating this table, a friend of the inventor undertook to write down the numbers as they appeared. In consequence of the copyist writing quickly, he rather more than kept pace with the engine, but as soon as five figures appeared, the machine was at least equal in speed to the writer. At another trial 32 numbers of the same table were calculated in the space of 2 minutes and 30 seconds, and as these contained 82 figures, the engine produced 33 figures every minute, or more than one figure in every two seconds. On another occasion it produced 44 figures per minute. This rate of computation could be maintained for any length of time: and it is probable that few writers are able to copy with equal speed for many hours together.

Some of that class of individuals who envy all great men, and deny all great inventions, have ignorantly stated that Mr. Babbage's invention is not new. The same persons, had it suited their purpose, would have maintained that the invention of spectacles was an anticipation of the telescope; but even this is more true than the allegation that the arithmetical machines of Pascal and others were the types of Mr. Babbage's engine. The object of these machines was entirely different. Their highest functions were to perform the operations of common arithmetic. Mr. Babbage's engine, it is true, can perform these operations also, and can extract the roots of numbers, and approximate to the roots of equations, and even to their impossible roots. But this is not its object. Its function, in contradistinction to that of all other contrivances for calculating, is to embody in machinery the method of differences, which has never before been done; and the effects which it is capable of producing, and the works which in the

course of a few years we expect to see it execute, will place it at an infinite distance from all other efforts of mechanical genius.—*Letters on Natural Magic, in the Family Library.*

THE GOLD REGION OF VIRGINIA.

The Rail Road Journal accompanies the following piece with a map of the gold region which it is unnecessary to offer to our readers who are acquainted with the geography of this part of Virginia, and who have access to larger and better maps. It is sufficient to copy the list of the mines now worked, and to add more full descriptions of their several localities.

The greater number of mines opened are in one neighborhood, through which passes the Rappahannock River and its principal tributary the Rapid Ann, and near their junction. These are,

The United States Gold Mine,		Spottsylvania	county.
Rappahannock	"	Stafford	"
Rattlesnake	"	do.	"
Culpepper	"	Culpepper	"
Millbank	"	do.	"
Virginia	"	Orange	"
Vaucluse	"	do.	"
Liberty	"	Fauquier	"
Union	"	do.	"
Millville	"	Orange	"
I. Payne's	"	do.	"
Greenwood	"	Spottsylvania	"

On both sides of the North Anna (head waters of York River) are,

Johnson's mine,	"	Spottsylvania	"
Dixon's	"	do.	"
Tinder's	"	Louisa.	"

On the north side of James River,

The Goochland mine		Goochland county.

And on the south side,

Booker's mine	"	Buckingham county.

The remainder of the article from the Rail Road Journal and from Mr. Shepherd's report, is copied below.

This map exhibits a condensed view of the gold region of Virginia, and is taken from a larger one belonging to Mr. F. Shepherd, of New-Haven, who has spent some months in surveying and exploring this interesting portion of our country. We say interesting, because the amount of gold annually obtained in the United States, is estimated in millions of dollars; and this amount is rapidly increasing when, comparatively speaking, the surface only of the ground has been disturbed in getting this precious metal.

We learn from Mr. S. that the undue excitement which the first discovery of gold creates in the minds of all classes, is now at an end in Virginia, and the business of getting gold is assuming a settled and systematic character. The farmer now goes on with his farming, and the experienced miner with his mining, and in this way each is mutually an aid to the other.

As to the richness of the Virginia ores, Mr. S. has given us full satisfaction, by simply pounding them in a mortar and washing away the sand in our presence, when, to our surprise, a large proportion of metallic gold appeared in numerous and beautiful grains, and this, too, from specimens which had no gold visible on the outside.

The following is an extract from the report of Mr. Shepherd:

"I am decidedly of opinion that Virginia is destined, sooner or later, to become a rich and prosperous mining country; that whenever skill and capital shall be judiciously applied, (in the language of an able and beautiful writer,) she will one day be to the country what Cornwall is to England, the seat of prodigious industry, and the source of individual and national wealth.

In coming to this conclusion I do not lose sight of the great natural advantages which Virginia possesses over other mining districts in the United States, and throughout the world. It will be seen by the map that by a little more than half a day's ride, any one can be transported from the city of Washington on the Potomac, to the gold mines on the Rappahannock, on the banks of a beautiful river made navigable by locks and dams, a distance of ten miles to tide-water and steamboat navigation, commencing at Fredericksburg, which is a busy inland town, at all seasons supplying a plentiful market. Add to this the very low price of provisions and labor, the vast abundance of wood and timber, the great number of water powers easily created upon the numerous streams, the peculiarity of the soil and earth as affording facilities for excavation, (since steam is now applied to all kinds of digging,) and finally the beautiful developement of the rich gold veins, said by those who have been observers in both countries, by far to excel Mexico, South America, or even Russia, so much celebrated of late for her gold mines. These veins are composed of quartz commonly called white flint, from one to four feet in thickness, generally perpendicular in the earth like a wall, supported on both sides by soft talcose slate, and extend from the surface to an unknown depth. It is not uncommon to find gold in the broken fragments of the veins at the surface, and it has also been found at the depth of 160 feet increasingly rich. The gold district lies in that part of Virginia between the tide-water and Blue Ridge, where the atmosphere is dry and exhilerating, the climate mild and agreeable, the water well tasted and pure, the inhabitants of that class so long and so justly famed for their hospitality and refinement, and for whose convenience, the great National or Southern Rail Road is about to pass by them as it were at their thresholds.

Still, with all these natural and extraordinary advantages, I feel it my duty, continues Mr. Shepherd, to give my friends and fellow-citizens of New England, a few words of advice by way of caution. That there is a very large amount of gold in the great state of Virginia, and that this large amount of gold may be extracted so as to afford a large profit, is clear to a demonstration; and I believe that this section of our country is worthy the attention of northern enterprise and capital. Yet it frequently happens that many persons have an idea that wherever gold is discovered, if they can but get possession of the lands, no matter at what price, their fortune is made for a certainty. This foolish impression has ruined many a man. The temptation is so great that where a person wishes to sell his land as gold land, and cannot find gold upon it, in order to effect his

object, he will sometimes bring gold sands and ores from a distance, and bury them upon his own grounds, which of course the purchaser finds out to his sorrow when too late. Again, some persons, on finding a few grains of gold, suppose that if they dig deep they will surely find the precious metal in masses and blocks. It is needless to add that such visionary day-dreams are rarely realized —still many are sanguine enough to pursue the chance with great ardor.

To those persons who engage in this business for the purpose of speculation, I would say that they will only be benefited at the expense of others, and will injure the mining interest of the country more in a few days than they can possibly repair in many years.

Finally, persons ought not to engage in this business without previous skill and experience. It is obviously unsafe for them to do so; and here is the cause of so many failures of companies and individuals. Gold mining is as much an art or trade as iron mining. What company of farmers would undertake of themselves to get iron from the ore? And what would be the probable result of such an undertaking? What would be the result if this same company of farmers should undertake to work the ores of zinc, so rich and abundant in this country? I have no doubt you anticipate the result correctly; and the same result is to be expected in their undertaking to get gold. Some persons in their ignorance suppose that if they expend a large amount, or venture a large sum, that they shall certainly realize something in return. Such visionary men lose their all, generally; whereas, in the hands of a discreet and experienced man, every cent of that money, like the well directed blows of the axeman, would be turned to a good account; and instead of a loss he would reap a reward of an hundred fold. In proof of this I have known a man to expend ten hundred dollars and get ten thousand dollars of gold for his reward, and from an examination of his lands, believe that he might labor all his life in the same prudent way, and with the same good success. Again I have known another man in the same situation precisely, expend the same sum and get nothing but a load of debt upon his shoulders instead of gold. Now will you say that these mines ought not to be worked? No, you will say let them be worked by honest, experienced and prudent men. Let this be done, and the capitalist will find his money profitably employed, and the millions of gold in Virginia will be made to circulate and gladden the hearts of millions of the human race now pining in want and "perishing for lack of knowledge."

ON WORMS AND CROWS, AND THEIR OPERATIONS ON CORN.

[The following piece was attributed, and we believe correctly, to the pen of the late John Randolph of Roanoke. The errors in our copy (and which were probably owing to the original manuscript) we have not attempted to correct.]

From the Richmond Enquirer, of May, 1820.

You may make the following addition to your agricultural news.

In some parts of the country, the young Indian corn has been totally destroyed by innumerable worms of different descriptions; such as cut-worm, wire-worm, grub-worm, &c.: one planter on Roanoke in Charlotte county has had to plant his whole crop over again. It is doubted by some whether the enclosing system of Arator (Col. John Taylor of Caroline) can be maintained unless our Entomologists shall devise some remedy for the worms which it permits to engender, to the probable ruin of the whole produce of the earth. Until the "butterfly-hunters" or "Horned Cock Society"* shall devise a certain cure, take the following palliative ("in mitigation of damages.")—Nurse your crows and blackbirds and all birds that devour earth worms, or their *Larvæ;* of which description, the crow stands foremost, and the crow-blackbird next. That they injure corn by pulling it up, is a vulgar error that may add another item to Sir Thomas Brown's Catalogue. The writer hereof has been a planter five and twenty years, and never lost an ear of corn thereby. It is true that they sometimes destroy a roasting ear by opening the shuck, but for one thus injured by crows, hundreds are opened by wood-peckers who do not eat earth worms, but are useful allies to fruit and timber trees. Planters (they of the belting system more especially,) who have dead trees in their fields for wood-peckers to build in, are incorrigible slovens, on whom even advice (cheap as it is) is thrown away. The fact is, the crow like the dog, eats bread when he can't find meat.

While the pen is in my hand, let me remonstrate against the barbarous custom of trimming up trees into brooms by way of improvement. If the tree has obtained a tolerably large growth, the trimming or topping of any main branch is (sooner or later) certain death. Arthur Young protested against this system of *Pollard trees* in France. It is like the Abyssinian beef-steak from the live cow, or the Chinese lady's club-foot and thick.

CUTTING CORN TOPS.

From the Cultivator.

Mr. Fessenden—I have made a small experiment the past season, to ascertain the damage, if any, that results to the corn crop, from topping the stalks in the usual way. And, influenced by the request of several individuals, and the thought that, perhaps, it might *lead* to a better knowledge of this important branch of agriculture, (the growing of corn,) I am induced to forward the particulars to you for publication. Although I am aware that *guessing* enters largely, and perhaps necessarily, into the calculations and business of the farmer, I am also aware that experiment cannot be conducted with too much precision; indeed, that experiment to be relied on, must be conducted entirely without guessing. Therefore, I have been somewhat particular in conducting this. And lest some of your readers may be a little sceptical in regard to the result, and perhaps unwilling to allow that the course which has been pursued by our ancestors, from time immemorial, is not the best course, I will give the details; and if an apology be deemed necessary, for being so very minute, I can merely say, that as the experiment seems to me so deeply to involve the interests of corn growers, it may be well to give a detailed statement of the case, so that any interested may be able to draw their own inferences. And if, in your opinion, it is worthy a place in your useful

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* See Chrysal.

journal, or likely to promote the interest of New-England farmers, you are at liberty to publish all, or a part, as you shall think best.

For a few years past, I have not cut my corn stalks until the corn was harvested, *guessing* that it was a course preferable to the one commonly pursued in this part of the country, of topping the stalks while in a green state. But for the purpose of settling this point more clearly, and with as little trouble as the case would admit, I selected, about the 5th of September, a row of corn in a field of about five acres, intending to take one that would average in quality equal to the field throughout, that I might at the same time be able to ascertain with tolerable certainty, the product of the whole field. The manure having been spread on the surface of the ground and harrowed in lengthwise of the furrows, and the corn planted across the furrows, made it apparently less difficult to select an average row. On this row I cut the stalks from half the hills; beginning at one end and cutting the first hill, then leaving the next uncut, and so proceeding alternately, cutting one and leaving the next uncut, through the row. I had intended to confine the experiment to this row, but finally was led to extend it so far as to include four rows, and numbering them agreeably to the order in which they were standing in the field, this row may be called No. 2. There were ninety-two hills in the row, and the stalks were cut from forty-six hills, all of them in the manner that is here termed jointing, (i. e.) cut off between the ear and the first joint above the ear. I thought they were somewhat more ripe than is usual at the time of cutting; a few of them were nearly dry. The soil was a sandy or gravelly loam, anciently covered with pine, oak and chestnut. In hoeing the corn no hills were made, but some care was taken that the surface of the ground should remain as level as possible, through the season.

My estimate of the number of hills on an acre, was made in the following manner, and if I am wrong in my calculations, I shall be corrected by some of your readers:

In an area of 200 feet square, (or 40,000 square feet,) there were sixty-two rows, with fifty-four hills to a row, making 3,348 hills. This is equal to 3,646 hills per acre, each hill occupying nearly 12 square feet of surface. There were about four stalks of corn in a hill. In estimating bushels, I have allowed the lawful weight of fifty-six pounds to the bushel.

At the time of harvesting, the corn was husked in the field. The forty-six hills from which the stalks had been cut, gave forty-eight and a half pounds of ears; and the forty-six hills on which the stalks had not been cut, gave sixty-two pounds of ears. The number of ears in the two cases was about the same; those from the uncut hills were evidently the best filled out and the most hale; on a large proportion of them the kernals were so closely wedged in, as to make it difficult to bend the ear at all without breaking it. There was very little mouldy corn in either case, a few ears were gathered, mostly from the cut stalks, but the whole quantity was so small as to make it questionable whether cutting the stalks had much effect in this particular.

Both parcels were carefully laid aside in a dry chamber for about six or eight weeks, at the expiration of which time they were again weighed, and the parcel of ears from the uncut hills had lost in drying about two per cent. more than the other; affording some evidence that the sap continued to circulate for a greater length of time, in the uncut than in the cut stalks. The uncut hills, gave 42 lbs. 8 oz. dry shelled corn, equal to 14 oz. 12½ grs. per hill, or 60 bushels and 8 pounds per acre. The parcel from the cut hills gave 33 lbs. 7 oz. equal to 11 oz. 10 grs. per hill, or 47 bushels and 18 pounds per acre; making a loss of 12 bushels and 46 pounds per acre, by cutting the stalks. Conclusive evidence, that while the sap is in circulation, nature does not assign the stalks an unprofitable office. The product of this whole row, taken together, cut and uncut hills, was equal to 53 bushels and 41 pounds per acre.

The product of row No. 3, taken by itself, (containing ninety-two hills, on one-half of which the stalks were cut on the same day the others were,) would not show the practice of cutting stalks quite so destructive in its effects, as that exhibited in row No. 2, its whole produce was 77 lbs. 9 oz. dry corn, equal to 55 bushels and 10 pounds per acre, or 1 bushel and 25 pounds per acre more than row No. 2.

Not satisfied with resting the experiment here, I gathered the corn on rows No. 1 and 4, (i. e.) the rows each side, next adjoining No. 2 and 3, and on which none of the stalks had been cut. These rows, taken together, contained 186 hills, and their product of dry shelled corn was 171 lbs. 13 oz. equal to 14 oz. 12½ grs. per hill, or 60 bushels and 8 pounds per acre, precisely the same average yield as that part of row No. 2, on which the stalks had not been cut; this exact coincidence, however, I think may be numbered among those cases which rarely happen.

The difference between the two rows on which half the stalks were cut, and the two rows on which none of the stalks were cut, was 5 bushels 38½ pounds per acre. If this difference arose from cutting half the stalks, (and I know of no other reason,) then cutting the whole, would have reduced the crop 11 bushels and 21 pounds per acre, or from 60 bushels and 8 pounds to 48 bushels and 43 pounds per acre.

To recapitulate: row No. 2, on which the experiment was commenced, taken by itself, is as follows, viz: 46 hills on which the stalks had not been cut, gave 42 lbs. 8 oz. dry shelled corn, equal to, per acre, 60 bush. 8 lbs.
46 hills from which the stalks had been cut, gave 33 lbs. 7 oz. dry shelled corn, equal to, per acre, 47 " 18 "

Loss by cutting the stalks, per acre, 12 bush. 46 lbs.

The four rows taken together, stand as follows:
No. 1 and 4, on which no stalks were cut, gave an average of, per acre, 60 bush. 8 lbs.
No. 2 and 3, from which half the stalks were cut, gave an average of, per acre, 54 " 25½ "

Loss by cutting one half of the stalks per acre. 5 bush. 38½ lbs. 2

On cutting all the stalks, would make a loss equal to, per acre, 11 bush. 21 lbs.

The difference in the result of the two cases, is 1 bushel and 25 pounds per acre; or, in the two experiments, (if it may be so termed,) there is an average loss by cutting the stalks, of 12 bushels 5½ pounds per acre; a loss quite equal to all the expense of hoeing and harvesting, especially when we consider that in hoeing, the labor of making hills was dispensed with.

If I had cut all the stalks, and obtained a crop of forty-eight bushels to the acre, the very fact of having forty-eight bushels, would, I think, be considered by farmers generally, in this section of the country, as proof positive that the stalks were cut without injury to the crop. Or if I had gone one step farther and made large hills, at an additional expense of one dollar per acre, and thereby reduced the crop to forty-five bushels per acre, the forty-five bushels would be considered sufficient proof, that making hills (which, by the way, are usually made equally large and high on wet or dry land, without regard to soil or situation,) was labor well laid out. For although you occasionally give us a *large corn story*, swollen a little, perhaps, by *guessing* it off in *baskets;* yet, judging from what we see and know about raising corn, we call forty-five bushels per acre, a good crop.

A measured bushel, from the cut hills, weighed 57 lbs. 6 oz.—one pound less than from the *uncut;* the shrinkage being very near equal to the whole loss in weight.

If this experiment is a fair test, it seems *that about twenty per cent., or one-fifth part of the crop is destroyed, by cutting the stalks in the way they are usually cut.* If further experiment should establish this fact, I think there are few farmers that will hesitate long in deciding which is the most valuable, one acre of corn or five acres of top stalks. But this twenty per cent. is not saved at the expense of losing the stalks, they are worth as much, and I think more, all things considered, after the corn is harvested, than they are, gathered in the usual way. If after being bunched up in a green state, they heat or become mouldy, (a case of frequent occurrence,) they are utterly worthless, except it be for manure; I know of no animal that will eat them. But after they have once been dried by the frost and wind, a subsequent moderate degree of mouldiness, seems to be no injury.

The course which I have pursued with them, and for the present I know of no better, has been as follows: In the first place, they are cut off near the ground, and for this purpose a short scythe is found the most convenient instrument. The expense of cutting in this manner, however, is but a mere trifle, if any, more than cutting the stub stalks in the spring, and may with propriety be entered as an item of expense against the next crop, for which it is preparing the ground. After cutting, they are gathered into bunches of suitable size for binding, and three good sheaves of rye straw, if wet, will be sufficient to bind a ton. In gathering them up and laying in bunches, an active boy will do as much as a man. In this way, the whole expense of gathering, binding and loading, will not exceed 75 cents per ton. As they are very bulky, for want of barn room, I have them stacked near the barn-yard; and I think I may safely say, that my cattle eat more pounds of stalks from an acre gathered in this way, than they would from the same acre, if gathered in the usual way. It may be objected to this, that they are not as good and nourishing as others; as to that matter, I am not able to say; but if the cattle are good judges in the case, (and I think they ought to be admitted as such,) they are quite as good and quite as nourishing, for they are eaten, apparently, with quite as good a relish. In addition to this, they are obtained without breaking off ears or breaking down hills in hauling out, occurrences quite frequent in the other case. They also furnish more than double the quantity of bedding for the yard, an item of no small moment in the list of "creature comforts," during our cold winters. And last, though not least, they make more than double the quantity of manure, the value of which will be duly appreciated by every good farmer, without argument. It may be said that the but stalks can be gathered after harvest, and furnish the same quantity of litter and manure as in this case; that is true; but the expense of gathering both parts in that way, from the buts being so short and inconvenient to bind, would be three times as much as it is to gather them whole. Thus viewing the subject in various points, I think this method of managing corn stalks is much better than the old one; and that a little observation and experience will convince the most sceptical, that this branch of agriculture is not yet brought to a state of perfection, that there is yet room for improvement.

In passing through a field of corn, about the first of September, I noticed that my clothes contracted a strong smell of smut, and not being aware that I had come in contact with any smutty ears, I was led to examine a little to ascertain the cause. I found many of the corn leaves nearly covered with rust (something similar to that observed on the stalks of English grain, preceding a blight,) and intermingled with the rust, was an abundance of very minute blisters of smut, or something which had the appearance and smell of smut. As I had never observed any thing of the kind before, and smut is said to be injurious to cattle, I have thought that something of this nature might have occasioned the difference of opinion, entertained by some of your correspondents, last fall, in regard to the utility of feeding milch cows with green corn stalks. Feeding cows with smutty stalks, even if "fed to the full," would probably tend to dry them up; while feeding them plentifully with healthy stalks in a green state, would undoubtedly increase their milk.

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Mr. Fessenden—I was highly gratified with the perusal of the leading article in your 38th No. from the pen of Mr. Clark, on cutting corn stalks. Experiments like those he has detailed, are of great value to the farming interest, and richly entitle those who make and publish them, to the appellation of public benefactors. I beg leave to suggest the cause of the difference in the product which resulted from Mr. Clark's experiments.

There is a striking analogy between the animal and vegetable kingdoms. Food taken into the stomach of animals does not nourish, but is prejudicial to health, unless it undergoes the process of digestion. Nor does food nourish the plant until it has been elaborated by the leaves. Plants, therefore, without leaves cannot grow; but, on the contrary, if defoliated in hot weather, the unelaborated sap becomes stagnant, ferments, and de-

stroys the vitality of the plant. Thus when the tops of corn are cut, the supply of food to all the ears above the remaining leaves, is cut off, and the supply is materially diminished to those below. A diminished product must of course be the consequence.

I very much regret that Mr. Clark did not carry his experiments one step further, and ascertain the relative weight of forty-six hills cut with the entire stalks, at the time he topped his No. 2. It would have decided whether the stalks afford nutriment to the grain, after they are separated from the roots, and to what extent. This last has been my method of harvesting my crop, from an impression that I lost by it nothing in the weight of the grain, while I gained much in the quantity and quality of the fodder. The objection that the stalks mould is not tenable. They will not mould while the corn is upon them, if tied above the ears. And if not sufficiently dry when the corn is picked, they may be left in stacks till perfectly cured; and yet be housed in far better condition than they are by the ordinary mode of saving them. It is not the drying that deteriorates their value for fodder, but the *drenchings* which they get when left out till the corn is picked, and the frosts, which diminish very much their nutritive properties. If well cured, and especially if cut and steamed, cattle eat them freely, and I consider them nowise inferior to hay. The grain from the crop secured in my way, has weighed sixty and sixty-two pounds the bushel. It is a twelve rowed early variety, which I denominate the Dutton corn.

I have remarked, that the modes of planting corn, or rather the distance between the plants, is different in different states. In New England, the distance is greater than in New York, and greater in Pennsylvania than in the former. Mr. Clark's hills were four by three feet, which gave him 3,646 hills, or by my estimate 3,630, on the acre. Our Mr. Stimson plants at two and a half feet each way, and gets upon the acre 6,969 hills, or nearly double what Mr. Clark does. I once planted an acre in drills, two rows in a drill, the plants six inches apart in the rows, the rows six inches apart, and three feet between the centres of the drills, quincunx, and had, if there were no vacancies, 30,970 stalks, equal to 7,742 hills on the acre. The ground and entire product were accurately measured and weighed. While the Messrs. Pratts, of Madison, produced 170 bushels on the acre, by planting in drills, three rows in each, quincunx, thus, : - : - and four feet from the centre of the drills. If the rows were six inches apart, and the plants nine inches in the rows, the plants amounted to 43,560, equal to 10,890 hills. Assuming as data, that in all the above cited cases each plant produced an ear of corn, and that the ears averaged one gill of shelled grain, their products would be as follows, in bushels and quarts:

Mr. Clark's, - - -	56 bushels,	13	quarts.
Mr. Stimson's, - -	108 "	24	"
My own, - - - -	120 "	31	"
Messrs. Pratts', - -	170 "		

The close planting, whether in hills or drills, requires high manuring, and the two and three rowed drills, extra labor; and the ears may withal be somewhat smaller. Yet I nevertheless believe that seventy or eighty bushels may be obtained on an acre, with good manurings on a genial soil, in our mode of planting, with about as little labor as twenty, thirty, or forty bushels, are obtained in the New England or Pennsylvania open method.

I have detailed the preceding facts and calculations, not with a view to vaunt of our skill or of the fertility of our soil, but to *show how* the large crops of corn have been raised in this state, which have been noticed in the papers.

There is one fact connected with the experiment of the Messrs. Pratts, worthy of consideration; there was not a plant missing, or deficient, in their field. They quadrupled their seed; and pulled up, as the character of the plants was developed, all but the requisite number, reserving only the strongest and most promising. It is common to see corn-fields very deficient in plants and even in entire hills. This deficiency often amounts to one-fourth or one-half.—The loss incident to this defect may readily be estimated, and greatly counterbalances the expense of extra seed, and the labor of thinning the plants.

J. B.

Albany, N. Y. April 9, 1832.

Diary of the temperature and state of the weather in July and August, observed at Shellbanks, Prince George county, 37 *deg.* 14 *min. N. Lat. —Thermometer kept in the shade, and in the open air.*

Fair or sunshine, f—*cloudy,* c—*rain,* r.

JULY.	Thermometer at Sunrise.	Weather.	2 o'clock, P. M	Weather.	9 o'clock, P. M.	Weather.	REMARKS.
21	69	c	80	f	77	c	
22	73	f	94	f	82	c	
23	75	f	92	f	82	c	
24	78	f	95	f	80	r	
25	71	f			81	f	
26	76	f	96	f	82	f	
27	75	f	89	c	78	f	
28	73	f	86	r	76	c	
29	73	f	94	c	74	c	
30	73	c			74	f	
31	70	c			76	f	
Aug. 1	71	c	87	f	74	f	
2	70	c		r	70	f	
3	65	f	84	f	72	f	
4	63	c	84	f	72	f	
5	65	c	89	f	75	f	
6	68	f	90	f	77	f	
7	67	f	92	f	76	c	
8	68	f	93	f	78	f	
9	68	f	94	f	82	f	
10	75	f	94*	f	79	f	
11			99†	f	83	f	
12	73	f	98	f	84	f	
13		f	98	f			
14	79	f	92	r	76	f	
15	79	c	90	f	74	f	
16	66	f	80	f	64	f	
17	60	f	85	f	71	f	
18	70	f	95	f	78	f	
19	70	c		f	65	f	
20	62	f	79	c	67	f	

* 96° at 3 o'clock.

† 95½° at 2, in an open passage within the house.

COMMERCIAL REPORT.

To the Editor of the Farmers' Register.

Sir—Your unexpected call for a communication at an hour's notice, must plead an excuse for greater imperfection than usual, and brevity will consequently be a recommendation.

In the months of August and September, wheat is in Virginia the most important article of commerce. The competition which existed among the millers, as noticed in July, was of short duration, but attended with very advantageous results to the farmers. During the present month the price has been gradually but slowly declining, and $1 10 per bushel is now an extreme price—$1 00 to $1 05 may in general be more correctly quoted, and some of the millers expecting a greater decline, show no disposition to extend their purchases beyond their immediate wants.

The productiveness of the wheat crop in Virginia falls greatly short of the expectations of the most reasonable farmers. If I am wrong in estimating the deficiency at 25 to 35 per cent. no one is more competent to correct me than yourself. The price of wheat in all our Atlantic markets is nearly or quite as low as in Virginia, and not the slightest cause exists at present to induce the expectation of any European demand. How can it be expected when the price of grain in the Baltic is much below ours? Cargoes of wheat are there contracted for, deliverable on board ship, at 23*s.* sterling per quarter of 560 lbs. or about 2*s.* 6*d.* per 60 lbs. A decline, rather than an advance in the prices of grain may be anticipated.

The current rates of cotton and tobacco have not varied this month. The cotton crop of the United States grown last year is ascertained to be about 1,200,000 bales, of which 1,000,000 have been exported to Europe since September last. The previous year (1832) produced 1,070,000 bales, of which 867,500 were exported to Europe. That so great an increase of supply should not have caused a proportionate reduction in the value, proves the flourishing state of the manufacture in Europe—but the diminished supply from other countries must also be taken into the account.

The inspections of tobacco in Virginia, thus far, prove about 3000 hhds. less than last year, but the export will not show a similar deficiency, as the quantity manufactured at home the present year is much less than usual. The low price of grain in Holland, &c. has no doubt caused a considerable increase in the cultivation of tobacco there and elsewhere in Europe, and it is evident that the supplies required from this country are much smaller than formerly.

The pressure for money which existed during the winter and spring has ceased, and its removal may be readily accounted for. The immense sums which were required to make advances to the Western and Southern planters and merchants, the still larger ones necessary to meet the purchase of the crops of cotton, sugar and tobacco, have generally reverted to the sources from whence they were obtained. Bills which were drawn at the South have reached maturity and been paid by bills on Europe. The commercial wheel has performed its revolution. At this moment the merchant finds no active and extensive use for his funds. Every one engaged in commerce must have observed that the months of August and September are holiday times with the merchants of the large cities, their period of recreation at watering places, or other resorts for health or pleasure.

Stocks generally have risen, and exchange also, owing to the temporary abundance of money, and to the recent change in the legal value of gold, as noted in my last communication.

Exchange on London is 106—Virginia Bank Stock 106—Farmers' Bank 102—United States' Bank Stock 110. x.

August 19, 1834.

THE FOREST PRUNER'S GOLDEN RULES.

No branches to be cut off which do not interfere with the leader; no wound, thus or otherwise made, to be larger than an inch in diameter; and no pruning in autumn.—*Gardener's Magazine.*

FARMING IN NORFOLK COUNTY.

To the Editor of the Farmers' Register.

White Plains, Norfolk County, July 1, 1834.

I have read each number of your very valuable periodical with increased delight, and must continue to do so, so long as it is a source of such useful information to the farmer. We need very much a work of the kind in this county, to guide us in our agricultural pursuits. We know nothing here from experience. Our old men are novices, and our young men the hopeless victims of *lumber getting*. We are infatuated with that potent tempter, and many hug their chains with enthusiastic delight. It will require some powerful means to break the spell, and I would to God that the Register might be the talisman. Though this business has threatened our highly favored county with destruction, yet we hope that the growing intelligence of the community, and the melancholy experience of past time, will cause us to rise in the majesty of our strength, and assert our claims to character and respectability in the agricultural world. I have persuaded many of my neighbors to subscribe to your Register, and the success that I have met with has not left me without hope. If we can get our farmers awake to their best interest, we have every thing to hope and nothing to fear: for our lands are only excelled by the western soil. They are well adapted to all kinds of artificial grasses, for we have never attempted to grow any kind, but our success has exceeded our most sanguine expectations; and as far as my limited experience will allow me to judge, plaster and lime take very well on our high sandy lands, by a judicious course of management. I would here give you some account of our system of cultivation, but the modes are almost as much diversified as the farmers are numerous. There is no fixed mode among us; and each follows his own as the best. My plan has been partly upon the drill system: first, to fallow the land with a single horse plough as early in the spring as the season will allow, in lands five feet wide and plant the corn in the ridges, (if the land is high and not likely to be inundated with water, to run a small furrow on the top of the ridge, but if low and springy, no furrow,) and plant the corn two feet a part, with four grains in each place, (though but one is to stand to secure if possible a level crop) the corn being first mixed with tar, sulphur, and

plaster, to prevent birds from taking it up. As soon as the corn gets up, the ploughs throw back the ridge by running the bar next to the corn, the hoes follow after and clean it out. We then "half hill," by ploughing every other row, with the mould board next to and as near the corn as possible; the hoes follow after, and earth the corn where the ploughs have failed to do it. We then hill by ploughing the rows that were left after the manner of half hilling. This is the plan that I have heretofore pursued, but the results have been so unsatisfactory, that I shall for the future abandon it, for some other. I like the plan of ploughing corn both ways the best: it is better suited to our convenience, most productive, and less injurious to the soil, unless in broken or very low land, where the land is injured by washing, or the land requires high ridging in order to prevent the water from overflowing it. I think I have had a good opportunity, of fairly testing the difference of the two systems. I generally allow my overseer a small piece of land for his family to cultivate on the farm where I live: he cultivates it after his plan of ploughing both ways, and to my surprise his corn has year after year been decidedly better than mine, though his land is no better, if indeed as good, and he seems to do his work with much more ease. But his is after the ancient order of laying off the corn four feet apart each way, with but one grain of corn in the hill; and better proportions I think might be adopted, and yet plough both ways. I shall not attempt to enter into the inquiry which of all the various systems of cultivating corn that are practiced with us is best. One thing is very certain, they cannot all be the best; and there is no stronger proof of the deep obscurity under which agriculture is laboring, than to see all its votaries pursuing different courses to arrive at the same destination.

You ask for information on the state of the crops generally; the corn and oat crops here, (for they are all that our farmers grow) are decidedly more promising than I remember of ever seeing them. If no accident happens it will be a year of jubilee with us, a new era in this generation, that Norfolk county will make corn enough to supply herself, and perhaps some to spare.

A. S. FOREMAN.

ON THE MANAGEMENT OF SLAVES.

To the Editor of the Farmers' Register.

Prince Edward County, 9th July, 1834.

In a country depending principally upon slave labor for its agricultural operations, as is the case with a large portion of Virginia and the Southern States generally, it would seem that a system for the general and minute management, in detail, of slaves, to be introduced into general use and practice, would be a desideratum in the economy of the country, most devoutly to be wished for; and which, so far as my observation has extended, has been as little attended to, and perhaps as little seriously thought of, as any subject of the least consequence, either in political or rural economy. The introduction of any such system, howsoever manifested its advantages might be made to appear, I am very sensible would be attended with extreme difficulty, and counteracted by such powerful opposing interests, that a moral certainty exists, that no such system can ever be introduced, but by the combined agency and influence of a very large portion of the most judicious and respectable gentlemen (and ladies too) in the country. The causes operating to obstruct the introduction of such a system, are probably much more numerous than it has been my lot to observe: and even such as have received a very large portion of my serious consideration for years, are more numerous than might be proper for me to attempt to introduce in detail, into a communication of this nature, unadorned with the grace and perspicuity which alone can attract the serious and favorable consideration of the great body of your readers.

My present object is merely to invite your attention to the subject, with a view to draw out others who may do it more justice than I possibly can, and to obtain the result of the observations and opinions of thinking people, through the medium of the Register, which being brought into general view, may result in combined efforts for the adoption of some such general system of slave management, and some such uniform manner of treating and providing for slaves generally, as the circumstances of the country will enable us to adopt, having reference principally to the agricultural interest of the country—which I feel assured would ultimately prove equally beneficial to all the honest classes of society, even so to those who would most strenuously oppose the introduction of such a system. Having introduced the subject, it might with propriety be expected I should be the first to publish my reasons for believing that such a system would be attended with benefit to the country, and to expose the existing evils growing out of the want of uniformity in the treatment and management of slaves. I should have no objection to do so, howsoever imperfectly the task might be performed, did I not in truth believe, that there are in the country, no inconsiderable number of abler hands and wiser heads, who can if they will, commence and carry forward a course of reasoning upon the subject, and introduce facts and arguments, in a manner much more beneficial to the public, than I possibly can; it being my opinion that a good start, in any business, gives generally the best prospects for ultimate success.

I will however suggest, that the intercourse, trading and dealing with slaves, which, to some extent, is too generally practiced and indulged in by free people, and in many cases by white people of unexceptionable general character, is probably an evil which has done more mischief to the slave population of the country, to the morals of both slaves and free people, and to the interests of the slave owners, and consequently to the agricultural prosperity of the country, than any other cause that has ever borne upon this subject. To do justice in portraying the mischiefs arising from this single cause, even if I were able to do it, would probably take more time and space, than would here be profitably employed. It renders the slave independent in a great measure of his master, thoughtless of, and careless in the performance of every duty, inattentive to, and even destructive to every interest of his owner, and only attentive to the means of carrying on his traffic, spending his nights in toilsome roving, and in debauchery, and from these causes, his days in a stupid inactive and utterly inefficient course of half performed labor, terminating too frequently in actual dis-

ease and destruction of life, but much more frequently is the cause of severe treatment, which would otherwise be unnecessary. Our laws upon this subject are wise and good, but interested avarice covertly operating upon public opinion, has defied their execution—and laws unexecuted, are worse than no laws.

CHARLES WOODSON.

FRUIT WITHOUT KERNELS, OR SEED.

To the Editor of the Farmers' Register.

Prince Edward County,

I propose to inquire through the medium of the Register, whether the art of producing stone-fruit without kernel or seed, is known to any of your readers—and if such art be known, what is the process by which this very desirable object can be effected. I have twice known late frosts to destroy the greater portion of the kernels in peaches, leaving some unaffected, which produced the fruit in every respect as common, with stone and kernel perfect, whilst the greater part of a sparse crop, came to perfect ripeness, with very small stones, which were generally cleft in the growth, and without kernels, and were incomparably more delicious: indeed so much more delicious, that the fruit having no kernel, growing on trees which generally bore very indifferent fruit, scarcely eatable, was found much more delicious, than the fruit with perfect stone and kernel, grown on trees that generally bore very fine flavored fruit.

CHARLES WOODSON.

ILL EFFECTS OF THE TRANSPLANTATION OF TREES.

To the Editor of the Farmers' Register.

Prince Edward County,

I submit for the consideration of your readers the inquiry, or doubt whether orchards, or fruit trees to any large number, ought ever to be transplanted in any soil. But knowing that much may depend on the soil, and particularly upon the substratum, I should like to see published the opinions of others, who have attentively observed the growth and manner of trees, raised in the different modes of transplanting, and from seed planted where the tree is to stand and grow for life. This suggestion is made with special reference to the larger kinds of trees, which take years to bring them into mature bearing, and should be expected to live long, to reward the expense and trouble of rearing. My own observations, for not less than forty years, have confirmed the opinion which I have entertained for thirty-five years, that upon such soil as is common in Virginia, from tide water to the Ohio River, no trees of large growth ought ever to be removed from the places where the seed came up, or be transplanted, except for some particular purpose, such as the introduction of new or desirable kinds, or the removal from places inconvenient or improper for them to grow in, to other places more desirable. The difference in the time it will take to raise orchards to good bearing state, by the different modes of transplanting, or by planting seed at once in the orchard, and grafting or budding on the young trees, is perhaps much less than would be supposed, when we consider that it generally takes several years to raise young trees in the nursery, to the largest size fit for transplanting. But the advantages in favor of the tree which grows to full maturity where it came up from the seed, it appears to me are manifestly greater than those obtained by bringing a transplanted orchard somewhat earlier into bearing. There is no fact better established by experience and observation, than that seedling trees, even when transplanted, are much more vigorous, and outlive grafts; and my observation leads me to the conclusion, that seedling trees which stand where they came up, as much outlive those seedlings which have been transplanted, as the latter outlive transplanted grafts; and I am inclined to think, that no grafted or budded tree is ever as sound and healthy as a seedling tree, or one the roots and branches of which are all of the same kind. I have scarcely ever noticed a budded tree, the wood of which did not become doated earlier in life than seedling trees of the same kind generally do. I would not however have it understood, that I consider it improper to transplant all such trees as may be convenient, or desirable for use or comfort, to obtain any necessary supply of fruit, a few years earlier than it could be raised by planting the seed. The history of my observation and experience follows. About the year 1784, my father planted out an orchard of grafted trees, apples and pears. For several years the young trees prospered and grew rapidly, till about the year 1790, when they began to die in every part of the orchard. It was made my business, though a small boy, to dig up the dead trees in the orchard, to trace every root that could be found, and remove entirely out of the orchard, every fragment of root that could be traced to the greatest depth and extent to which the roots had ramified. This operation continued from year to year, till about the year 1800, when a number of apple trees died, and were thus taken up, some of which measured near a foot in diameter. There was never a root found by me, which had penetrated more than about a foot deep in the ground. It had also been made my business, to raise seedling nurseries of young apple trees, and to dig them up when about the size of large goose quills, to be used as stocks for hand grafting, to be planted out again, after being grafted, for the purpose of raising grafted nursery trees, to replenish the orchard. Sometimes when I wished to hasten the growth of my young grafts, I dug up the seedling stocks, about as large as goose quills, with all the tap roots that could be obtained by digging to the greatest depth that the tap roots had penetrated the substratum, and generally found that they had descended about twenty-seven inches, and in a few cases thirty-six inches. This led to the conclusion, that the tap root once cut, never attempted to grow downward again, or if it did attempt to grow downward, its efforts were too feeble to penetrate, even a moderately hard substratum: that tap roots growing so deep from small trees, must go much deeper from large trees, and steady and support them greatly against storms, as well as to render the tree more healthy, by enabling it to sustain uninjured the severest drought, particularly where orchards have been planted upon hillsides, and from the necessary tillage of the earth, the surface will be washed and removed downhill, gradually leaving the extended roots of the trees exposed near the sur-

face, to suffer greatly in dry seasons. I would not advise to plant trees on hillsides, but a great many people must plant them there, or not have them at all—neither would I advise to plant on perfect level land, upon which, or in which, the water would be retained, so as to sob the land, and injure the roots of the trees.

CHARLES WOODSON.

GRUBS OR BOTS IN HORSES—AND COLIC.

To the Editor of the Farmers' Register.

Prince Edward County,

I am aware that the popular prevailing and almost universal opinion is, that bots or grubs in horses, frequently cause their death by eating through their stomachs. Erroneous as I certainly think this opinion, I should abstain from controverting it, in consequence of the very numerous and respectable witnesses who have united in asserting it to be a fact, that they have frequently seen the stomachs of horses perforated by the grubs, to a perfect riddle, passing themselves, and letting out the contents of the stomach into the chest of the horse, were it not that I think it the duty of every man in society, to controvert what he verily believes to be injurious error, at the least, by giving his reasons for being of a different opinion. I have seen many horses opened that were thought to have been killed by grubs, and examined the intestines of several with very great care and attention. With the solitary exception of a single grub, I never saw one fastened upon any part of the intestines, except in a *short canal or passage between the upper and lower stomach,* * frequently lining the whole passage to overflowing, where they insert their heads into the membranous fleshy substance of the canal, which is much thicker than the coat of the stomach, forming cells like honey comb, but never passing through: nor does it appear that they ever let go their first hold, till they arrive at full maturity, and are ready to pass off, and be discharged with the excrement, unless they should be forcibly detached, which is sometimes, but rarely, the case. Where a number of full grown grubs have detached themselves all nearly from one spot, leaving some smaller immature grubs scattered about, and not so deeply settled, they sometimes get rubbed off by the passage of rough food, and sometimes, but very rarely, are found mingled with the food in the stomach, and by possibility may fasten again on some other part of the intestines. In the single instance noticed above, I saw a grub fastened on some part of the stomach, where he had made a pretty deep cell, but had not penetrated more than half through, the stomach seeming to have swelled and thickened considerably at that point.

Some years past I lost a valuable horse, that upon examination certainly died by hoving or bursting of the stomach, occasioned by being carelessly starved, and then full fed with as many dry clean oats as he would eat. Upon opening him for examination, there were present three or four white men, and eight or ten grown negro men, who all with one accord, declared that the grubs had eaten his stomach to a perfect riddle, and let out a portion of the food and grubs into the chest; the white men were so fully satisfied that the grubs had eaten through the stomach, and killed the horse, that I could not prevail upon them to remain till I had examined farther to my satisfaction, which I did alone, and found that the holes which they thought had been eaten by grubs through the stomach, were occasioned by the swelling of the food in the stomach, which burst it open in that manner, the parts giving way and opening in a kind of net work, showing on slight examination, the appearance of holes eaten through by grubs, and through the largest of which holes, a portion of the food, and some two or three grubs had passed out. I had before that seen like openings, not quite bursted through the stomach of a horse, that had no grubs in him, and was supposed to have died with colic. If it be the fact, that grubs do not destroy horses by eating through their stomachs, of which I am as certain as of any thing not positively known, it follows of course, that very sick horses in imminent danger of speedy death, need never be treated with any view to destroy or remove grubs, even if medicines were known of certain efficacy in their immediate removal or destruction; but experiments frequently tried, demonstrate the fact, that grubs cannot be killed by the administration of any medicine, that would not certainly kill the horse. I have immersed them for twenty-four hours in spirits of turpentine, ardent spirits, in camphorated spirits, in oil, and various other infusions, none of which destroyed life in grubs of any size, from small maggots to full growth,—which facts and opinions taken together, are sufficient to demonstrate the propriety of treating very sick horses, with the view to cure some other disease, which may most commonly be considered colic in some form, to cure which there is never any lack of doctors, scarcely any two of whom agree in their use of the same remedies. Nevertheless, it will not be denied, that different remedies may be good in the same disease. The most generally successful practice which has fallen under my observation, when horses have been very sick apparently with colic, is to drench them immediately with a quart or more of very strong soap suds, of old soap if to be had—the suds made quite thick and ropy, and to be given lukewarm; and soon as possible bleed freely, and throw up an injection of a strong decoction of tobacco, say two quarts, milk warm. This relaxes the whole system, and should the horse recover, he should by all means be permitted to rest till his strength shall be certainly recruited. In case the horse swells, with indications of speedy death, the last remedy is to stab him with a trocar and canula, if to be had, or a knife four or five inches deep, in a right line exactly half way between the left hip bone and the lower end of the short-rib, turning the point of the instrument a little forward and off from the loin, in order to avoid striking the kidney and be certain to perforate the large intestine which presses against that part of the flank. If a knife is used for stabbing, it will be proper to have a tube of some kind, made smooth and inserted into the orifice as soon as the knife is withdrawn, in order to let out the wind, the free escape of which, is frequently prevented by the closing of the orifice in the flank, and by a change of position, bringing the orifice in the intestine to press against some other part, and thus prevent the escape of

* I am not very certain, (relying on memory alone) of the precise location of the grubs.

air from the intestine: (Judge Peters' remedy.) If a tube is used, such as a large reed or small elder, it is proper to fasten a strong string securely round the outer end, by which it should be held to prevent its slipping into the chest of the horse, which may be done by any other convenient means. A large quill cut half way through at the upper part of the barrel, and the lower end cut off makes a tube that will answer the purpose, to be held by the feather end. I have stabbed a number of horses with invariable success, and apparently no injury. After a horse has been attacked with colic, particularly if relaxing medicines have been used, and especially if the decoction of tobacco has been injected, he should be put into a dry house large enough for him to wallow without injury, and a plenty of soft dry litter should be spread on the floor. He should not be permitted to get wet or run out of nights for several days. It is not improbable, I should think it certain, that grubs do great injury to horses, by impairing their general health, and increasing their liability to severe attacks of colic, &c.—wherefore if any means can safely be used to prevent their propagation or to expel them it might be well. Frequent rubbing the horse with a greasy cloth in nit season on the parts where the nits are fastened is strongly recommended, as well as scraping off the nits, and killing the nit flies. A free use of dry pounded rosin two or three times a week, well mixed with the food, has been recommended by a person who kept horses in very fine order.

CHARLES WOODSON.

[The views above respecting bots, are sustained by the following article from one of the latest English publications on the diseases of horses.]

BOTS IN HORSES.

From the Farmer's Series of the Library of Useful Knowledge.

In the spring and early part of the summer, horses are much troubled by a grub or caterpillar, which crawls out of the anus, fastens itself under the tail, and seems to cause a great deal of itching or uneasiness. Grooms are sometimes alarmed at the appearance of these insects. Their history is curious, and will dispel every fear with regard to them. We are indebted to Mr. Bracy Clark for almost all we know of the bot.

A species of gad-fly the *œstrus equi*, is in the latter part of the summer exceedingly busy about the horse. They are observed to be darting with great rapidity towards the knees and sides of the animal. The females are depositing their eggs on the hair, and which adhere to it by means of a glutinous fluid with which they are surrounded. In a few days the eggs are ready to be hatched, and the slightest application of warmth and moisture will liberate the little animals which they contain. The horse in licking himself touches the egg, it bursts, and a small worm escapes, which adheres to the tongue, and is conveyed with the food into the stomach; there it clings, by means of a hook on either side of its mouth, to the cuticular portion of the stomach, and its hold is so firm and so obstinate, that it will be broken before it will be detached. It remains feeding there on the mucus of the stomach during the whole of the winter, and to the end of the ensuing spring; when, having attained a considerable size, and being destined to undergo a certain transformation, it disengages itself from the cuticular coat, is carried into the villous portion of the stomach with the food, passes out of it with chyme, and is at length evacuated with the dung.

The *larva* or maggot being thus thrown out seeks shelter in the ground, contracts in size, and becomes a chrysalis or grub; in which state it lies inactive for a few weeks, and then, bursting from its confinement, assumes the form of a fly. The female, becoming impregnated, quickly deposites her eggs on those parts of the horse which he is most likely to lick, and so the species is perpetuated.

There are several plain conclusions from this history. The bots cannot, while they inhabit the stomach of the horse, give the animal any pain, for they are fastened on the cuticular and insensible coat. They cannot stimulate the stomach and increase its digestive power, for they are not on the digestive portion of the stomach. They cannot, by their roughness, assist the trituration or rubbing down of the food, for no such office is performed in that part of the stomach—the food is softened, not rubbed down. They cannot be injurious to the horse, for he enjoys the most perfect health when the cuticular part of his stomach is filled with them, and their presence is not even suspected until they appear at the anus. They cannot be removed by medicine, because they are not in that part of the stomach to which medicine is usually conveyed; and if they were, their mouths are too deeply buried in the mucus for any medicine, that can safely be administered, to affect them; and, last of all, in due course of time they detach themselves, and come away. Therefore, the wise man will leave them to themselves, or content himself with picking them off when they collect under the tail and annoy the animal.

BLASTING ROCKS.

From Goodsell's Genesee Farmer.

As many lives are yearly lost by the untimely explosion of the powder used for blasting rocks, humanity prompts us to give a process as we heard it described a few days since, by a person who had been injured in a mine where many accidents of the kind had happened which led them to try other methods of charging the rocks than those commonly practiced and which he said ended in the discovery of a safe and expeditious manner of blasting. As these accidents had uniformly happened, in what he denominated the "tamping" or driving down the brick and other substance used in filling above the powder, they for an experiment, substituted plaster of Paris, which had been heated, as for preparing cement, which they mixed with water in the same manner, and poured the cement into the hole upon the powder, having first introduced the quill or fuze; the cement immediately set or hardened when the blast was ready for firing. He said that he never knew a blast managed in this way to fail of doing well, and never knew an accident happen; that it was quicker done and was more economical in every respect. If this should prove correct it should be generally introduced.

GRADUATES OF THE UNIVERSITY OF VIRGINIA.

The tenth session of the University of Virginia closed on the 19th July, when Degrees and Certificates were conferred on the following students, who had been admitted by the Faculty to these honors in the several schools and classes mentioned below. The names are placed in alphabetical order.

SCHOOL OF ANCIENT LANGUAGES.

In Latin Language and Literature.

Septimus D. Cabaniss, Demopolis, Alabama.
Tully R. Cornick, Princess Ann.
Benjamin J. Darneille, Albemarle.
Jacob D. Dudley, Richmond.
William T. Early, Orange.
John M. Forbes, Falmouth.
John M. Gardner, Washington city.
John B. Lynch, Tennessee.
Augustine S. Magill, Winchester.
Thomas L. Patterson, University of Virginia.
David H. Tucker, Jefferson.

In the whole School of Ancient Languages, (including Latin and Greek Languages and Literature.)

Thomas T. Bouldin, Charlotte.
Peter Carr, Albemarle.
Archibald Cary, Fluvanna.
Frederick W. Coleman, Caroline.
Beverly Jones, Mecklenburg.
Thomas Leigh, Halifax.
John A. Meredith, New Kent.
Charles D. Morris, Caroline.
Charles H. Randolph, Richmond.
Edmund Ruffin, Prince George.
Francis S. Sampson, Goochland.

SCHOOL OF MODERN LANGUAGES.

In French Language and Literature.

Peter Carr, Albemarle.
Archibald Cary, Fluvanna.
James H. Davis, University of Virginia.
Nathaniel Harrison, Amelia.
Augustine S. Magill, Winchester.
Robert Patterson, University of Virginia.
John W. Stevenson, Richmond.
Thomas B. Washington, Jefferson.
Thomas L. Patterson, University of Virginia.

In Spanish and French Languages and Literature.

James H. Davis, University of Virginia.
Fayette Robinson, Richmond.

In Italian Language and Literature.

Augustine S. Magill, Winchester.

SCHOOL OF MATHEMATICS.

William B. Archer, Richmond.
J. B. Lynch, Clarksville, Tennessee.
Andrew R. McKee, Charlottesville.
George G. Minor, Albemarle.
Francis S. Sampson, Goochland.
Robert W. Tomlin, Hanover.

SCHOOL OF NATURAL PHILOSOPHY.

William B. Archer, Richmond.
Thomas T. Bouldin, Charlotte.
John C. Burrus, Huntsville, Alabama.
John H. Christian, Henrico.
Frederick W. Coleman, Caroline.
Benjamin J. Darneille, Albemarle.
Jacob D. Dudley, Richmond,
John M. Forbes, Falmouth.
Washington Van Hamm, Zanesville, Ohio.
John W. Harris, Nelson.
Walter D. Leake, Goochland.
Andrew R. McKee, Charlottesville.
George G. Minor, Albemarle.
William W. Minor, Albemarle.
George L. Nicholson, Middlesex.
Moses M. Pailen, Richmond.
Micajah Pickett, Meadville, Mississippi.
Zebulon M. Pike Powers, King and Queen.
John W. Stevenson, Richmond.
David H. Tucker, Jefferson.
William S. Triplett, Richmond.
Overton D. Watson, Albemarle.
John T. Winn, Adams county, Mississippi.
John S. Woods, Albemarle.

SCHOOL OF CHEMISTRY AND MAT. MEDICA.

In Chemistry.

Alexander L. Beard, Loudoun.
Thomas T. Bouldin, Charlotte.
John H. Cochran, Loudoun.
Robert J. Davis, Lynchburg.
John G. Fulton, Augusta.
John W. Harris, Nelson.
Richard J. Harrison, Sussex.
Augustine S. Magill, Winchester.
John A. Meredith, New Kent.
William W. Minor, Albemarle.
Charles Minor, Louisa.
Zebulon M. Pike Powers, King and Queen.
Charles H. Randolph, Richmond.
Edmund Ruffin, Prince George.
John R. Woods, Albemarle.
John B. Young, Henrico.

SCHOOL OF MEDICINE,

With title of "Doctor of Medicine."

William A. Baynham, Essex.
Alexander L. Beard, Loudoun.
David N. Bliss, Connecticut.
Thomas J. Pretlow, Southampton.
Edwin H. Smith, Richmond.
Jacob Alonzo Smith, Henrico.
Thomas Withers, Dinwiddie.

The following Students received Certificates of Proficiency in Medical Jurisprudence:

James H. Davis, University of Virginia.
Willim Frazier, Augusta.
Hudson S. Garland, Nelson.
George P. Holeman, Fluvanna.
Archibald T. E. Robertson, Richmond.
John W. Stevenson, Richmond.
Nathaniel A. Venable, Prince Edward.

SCHOOL OF MORAL PHILOSOPHY.

Archibald Cary, Fluvanna.
Frederick W. Coleman, Caroline.
James H. Davis, University of Virginia.
Washington Van Hamm, Zanesville, Ohio.
Thomas T. Land, Rankin, Mississippi.
John B. Lynch, Clarksville, Tennessee.
Augustine S. Magill, Winchester.
John A. Meredith, New Kent.

Charles Minor, Louisa.
Moses M. Pallen, Richmond.
Thomas L. Preston, Washington county.
Charles Randolph, Richmond.
Edmund Ruffin, Prince George.
Frances S. Sampson, Goochland.

The following Students received Certificates of Proficiency, in Political Economy:

John H. Christian, Henrico.
James H. Davis, University of Virginia.
John W. Stevenson, Richmond.
Thomas B. Washington, Jefferson.

SCHOOL OF LAW.

Wm. H. Brockenbrough, University of Virginia.
James L. Carr, Albemarle.
William Frazier, Augusta.
Burwell G. Garth, Albemarle.
William Martin, Henry.
John B. Minor, Louisa.
William M. Randolph, Powhatan.
McClurg Wickham, Richmond.
John B. Young, Henrico.

The following gentlemen have attained the Degree of *Master of Arts of the University of Virginia*—the highest honor which the institution can confer—and that requires the Student to have previously graduated in the Schools of Ancient Languages, Modern Languages, Mathematics, Natural Philosophy, Chemistry, and Moral Philosophy.

John H. Cochran, Loudoun.
James H. Davis, University of Virginia.
John A. Meredith, New Kent.
Charles Minor, Louisa.
Charles H. Randolph Richmond.
Edmund Ruffin, Prince George.
John B. Young, Henrico.

ESTIMATES OF THE EXPENSES AND PROFITS OF REARING SLAVES.

[Written in 1832.]

For the Farmers' Register.

The great question of the effects of slave holding on the prosperity of the people of Virginia, has lately occupied the attention of every citizen: but long as the subject has been debated, and numerous and oft repeated as were the arguments and estimates presented, still the existence of slavery was considered only as to its effects on the welfare of the community, and not on private and individual interests. A party question was raised—and whether it was treated in its political, moral, or religious bearings, partizan feelings entered into, and governed both sides of the discussion. Neither truth nor reason can be expected on any subject, from arguments and debates so influenced. No one more than myself condemns the manner in which the debate on this subject was raised and conducted in the Legislature of Virginia: and as an owner of slaves, (and one whose income is derived almost entirely from their labor,) I assert an unquestionable right to my property, and protest against every attempt to deprive me of it without my consent. But at the same time, it may be both proper and expedient, that we who hold this property, and contend for these rights, should examine for ourselves what is the true amount and value of the pecuniary interest of each slave holder, and properly estimate the worth of what we are contending for. The general interest is only the aggregate of all the individual interests—and to arrive at the truth respecting both, a little arithmetic will aid us more than volumes of declamation. I ask the attention and assistance of those who are like myself interested in this kind of property, in the attempt I shall make to estimate the cost of rearing slaves, and the market value thence derived. I shall endeavor to avoid all the other considerations, important as they are, that press upon this subject—and without meddling with politics, or morals, mine will be the more humble object to ascertain how far the private individual interests of farmers are concerned—and by the same mode, and on similar grounds, as the profit or loss of rearing live-stock of any kind would be estimated. The consideration of slave holding as a matter of agricultural finance, is presenting the subject in a form that may be disgusting to many, and repulsive to all. Nevertheless, it is the only correct mode for establishing the truths I seek, or of erecting a sure and solid foundation for the discussion of the general question.

The rearing of slaves in Lower Virginia has so generally been considered a source of profit to their owners that it has scarcely been questioned or doubted. But I have never known any proof of the fact exhibited, nor even sought for. A few female slaves, in the course of twenty-five or thirty years, will often yield an increase of eight or ten times their number, and as great a multiplication of their own first value—and the great augmentation of capital in such cases, is taken as sufficient evidence that great profit has been thence obtained. Yet nothing is more fallacious than deductions so made. An estimate of profit or loss might however be obtained, with sufficient accuracy, by using the following data: 1st. The cost in purchase money, or the value of the mother, and the annual cost of maintenance of herself and children, for a certain length of time. 2nd. The market value of the slaves at the end of that time—and 3d. The average probability of the continuance of life during the same time.

Money may be lent on good security for 6 per cent. interest. If a man vests his money in trade, or in building houses for rent, and thereby obtains 10 per cent. only 4 per cent. is the amount of his profit for the risk and trouble attending his investment, as the remainder was the fair value of his money. If the whole average annual returns from his new business amounted to no more than 6 per cent. there would be no profit whatever, and no man knowingly would vest his money so uselessly, if there was in this business more trouble or risk, than in making ordinary loans.

The net hire of a slave shows what is the value of his labor to his employer, and to his owner. The price for which he would sell shows what amount of capital is so vested. If the demand for the labor of slaves was limited to one district, the prices of hire and of sale would always bear a fair proportion to each other. But the price of hire marks the value of labor here, while the selling price is fixed by the demand of Alabama or Louisiana—and therefore the two may be quite disproportioned; and the selling price being now regulated by the far greater demand, must of necessity

greatly exceed the hire, which is founded on the less demand for labor at home.

From these plain and indisputable premises, it will follow necessarily, that a monied capital vested in slaves, and those slaves hired out, can yield no profit whatever. It is true that no man ever thought of so using his money: but that does not affect the result of the argument. If it would be *unprofitable* to make such an investment of money, it is equally unprofitable to keep it so vested, as is done in thousands of cases. Nor is the truth of the principle effected by the owner's retaining the slaves in his own employment, instead of hiring them to others. He may thereby insure their being treated more humanely, but will not obtain much more profit, for it is certain that those who hire slaves, on the average pay more than a fair price. It should be observed that I allude altogether to slaves employed either in field labor, or otherwise on our farms. The value attached to particular slaves for their moral or mental qualities, or as domestic servants, has nothing to do with the question.

I will now proceed from general to particular estimates. The first presented will be a case of the simplest kind, viz: a female slave without children, and whose value and services are not affected by child-bearing. On this supposition a young woman of eighteen or twenty years, would sell for $300, and would bring the unusual high annual hire of $18, or the bare interest on the purchase money. At these rates, it would require that her life should be not only without infirmity, without disease, (or the cost of it, in physician's bills,) but also *without end*, to yield the common profit of capital to her owner. It requires no farther detail to show that holding such property must be attended with certain loss. But for the purpose of aiding other estimates, let this be considered in another point of view. Suppose the average life of this woman, fit for labor and free from infirmity, to be twenty years; or to continue to thirty-eight or forty years of age. This must be ample allowance, as her expensive old age is a fair deduction from a longer continuance of her more profitable years. Then to avoid bringing loss to the owner, her annual hire, clear of all expenses, should not only pay the interest on $300, but also as much more as would suffice to repay that amount of capital, by annual payments for twenty years. The sum necessary for both these purposes, (estimated by the rules for fixing the value of annuities,) would be about $26 50—which if received in annual net hire, would reimburse the owner, but not leave a cent of profit. But according to the foregoing supposition, the annual hire would fall short of that sum by $8 50: and that loss for twenty successive years, would be equal to $97 40 deducted from the first value of the slave, or nearly one-third of the capital so vested.

Let us next suppose the far more common case that the female slave at the age of eighteen or twenty begins to bring children, and for the twenty years that the chance for a life of labor was supposed to continue, is not twelve months together free from pregnancy, or the nursing of an infant. In such a case, or even in any approaching to it, it will be readily admitted that the labor of the mother will not be worth more than her own maintenance, and consequently that she would bring in nothing as hire: and it is equally clear, that if all hire is lost, the whole value of the slave is completely sunk. But it is supposed that this loss is more than compensated by the value of her children. To test the truth of that opinion will be the object of the next estimate.

The cost of maintaining a negro child from its birth to ten years of age, in food, clothing, nursing, medical attendance, &c. cannot be less than $14 a year—and that age is as early as the labor of the child can begin to pay for its support. The sum of $14 paid annually for ten years, is worth at the end of that time, $184 52—and that amount must be exceeded by the value of the child, to give any profit for its rearing. Few children of that age will sell for so much—and taking a general average of sex and value, $170 may be assumed as a full price, which would make a loss of $14 52 on the investment; even if the child lived so long. But there is an equal chance that the child may die before ten years old, which of course would cause a total loss of the previous expenditure. The insurance against so probable a casualty, is a fair deduction from the value that may accrue—and that insurance would probably take off one-fourth of the value of the slave—and make altogether an average loss of $56 on each child born.

The assumption that it is an equal chance that a child will die before the age of ten years, rests on a comparison of the tables of the probabilities of life, prepared by Dr. Halley from the bills of mortality of Breslaw, and those of London and Northumberland, by Dr. Price. According to these Tables

At Breslaw, from	1000	births,	661	lived	10 years.
London,	28452	"	11582	"	"
Northampton,	11550	"	5675	"	"

The average of which shows less than one-half surviving to the age of ten years.

Thus, unless the foregoing estimates are very inaccurate, it is manifest that there is certain loss, instead of profit, to be met with in rearing slaves, or in owning females of any kind, whose value depends only on their physical qualities. It was not my purpose to extend the inquiry to the cost and profit of owning male slaves fit for labor. But even as to these, a comparison of selling prices with the net amount of hires, for the probable duration of a life of a labor, will show that the profits of ownership are commonly and greatly overrated.

The foregoing estimates and deductions were written in the early part of 1832, and I have chosen to present them without alteration, although the prices of slaves have greatly varied, and more than once, since that time. Such temporary alterations of market prices, in no manner affect the truth of my plan of estimating value—except that such fluctuations are, in the general, injurious to the interest of those who hold the property; and can be beneficial only to those who speculate on the chances of the rise and fall of prices. The prices stated above both for hire and sales of slaves are believed to be as high as a fair average would indicate—and as high as can be expected of any future average, whether of ten, twenty, or fifty years. These explanatory remarks are perhaps superfluous—but they are offered to prevent having hereafter to meet the ready objection, that

my statement of prices was incorrect. If the general fairness and correctness of the estimate should be objected to, or the deductions from these premises (if their correctness is admitted,) be denied, I shall be ready and willing to maintain my positions, and pursue the investigation of the subject—still however considered as one merely of domestic and national economy.

A SLAVE HOLDER.

EXTRACTS FROM PRIVATE CORRESPONDENCE.

SEASONS AND CROPS—THE FENCE LAW—EFFECTS OF MARL—MAGADABA BEAN AND PARTRIDGE PEA—QUERIES ON HOGS AND PIGGERIES.

Charles City, July 3d, 1834.

If I was a good pensman I should like to tell you something about the Coggins Point marl, and what it is doing. I have seventy-four or five thousand corn hills marled. In my field at this time the corn is from hip to waist high. The marl was spread this spring after the land was fallowed. The corn along side of that marled is from ankle to half leg and knee high. I have thirty thousand corn hills that have been limed. The corn on that is about knee high. This is the second crop of corn I have had on it since I have rented the land. So far as I have been able to judge between the two, I prefer the marl.

—

Camden, S. C. July 16.

We are full of rail roads. The Charleston people want Camden to join Columbia in a road to the junction of the North and South Edisto. The Sumter folks want Camden to join in a road to the Santee, and thence to Charleston. For the benefit of the mail the former must be eventually laid down; but the importance of having a great road from North Carolina on the right bank of the Pee Dee should give that a preference. However, *nous verrons.*

—

Buckingham C. H. July 25, 1834.

The wheat is uncommonly fine in *quality,* though short in *quantity.* Crops of corn *never* more promising, at this season of the year. We have had abundant rains, without having any storms to do injury in this neighborhood.

—

Newbern, N. C. July 22.

I left Florida the middle of June. At that time crops were promising but suffering from drought. I infer from subsequent information that the drought did not continue long enough to do much injury. Late reports from Alabama speak favorably of the growing crop, and it is now probable that the crop of cotton will be large. I shall look with some anxiety for the effect of this on *prices.* At this place the rains, for ten days past, have been excessive, and the injury in the immediate neighborhood is probably considerable. I do not know how far these rains have extended.

The "Magadaba Bean" of one of your early correspondents, I suppose to be the *Aeschynomene hispida* of botanists, which however naturally prefers a sandy, but moist soil. It is sometimes denominated "False sensitive plant." The partridge pea is the *Cassia chamaecrista* of botanists, and is not a *vine,* as one of your late correspondents seems to suppose.* The amphicarpa monrica, a sort of wild pea, is a vine running over small shrubs.

Is the common mode of rearing hogs in the Southern States an economical one? I mean that of suffering them to range at large, and calling them up once a day to receive a small allowance of corn?

Could you not procure from some experienced person *at the North* the best mode of constructing and managing a *piggery?* There is a valuable account of one in New England in one of the volumes of the American Farmer. Some one has lately mentioned to me an account of a remarkable one contained in Mr. Poinsett's Notes on Mexico.

—

Camden, S. C. July 26.

The crop of corn and cotton in the Southern and Western States will be overwhelming. We have had plenty of rain and no freshets.

—

Caroline, July 28.

The prejudices which most of our old farmers entertained against marl are rapidly vanishing, and ere long, I hope to see our beautiful district of country, still more beautiful from its effects. My nearest neighbor Mr. J. H. B——, marled very heavily an acre of land last fall, and seeded it in wheat and clover. The wheat was improved by its application, and the clover is now so much better than that adjacent, that the eye detects it at a considerable distance.

I marled two acres in the spring, and seeded them in oats and grass seeds. I put about two hundred and fifty tumbril cart loads on this lot. The marl used was principally taken from the surface of one of my marl banks. There was no shell in it, but the impressions of many—and every lump was interspersed with selenite—pure gypsum. The lot produced me one hundred and seventy-five bushels of clean oats, heaping measure. This seems to me to be a good product. The rains in the spring had beaten down these oats frequently—and when cut, grass blades were used, in consequence of their tangled condition. But for these drawbacks it is probable the product would have been two hundred bushels. As your writings on the subject had first directed our attention to the effects of marl, I thought that you would not deem me impertinent to communicate the above facts to you.

[* Our two correspondents certainly mean different plants under the same name. The partridge pea so well known in Lower Virginia is the same described (in the former communication from Cambridge, Md.) as a vine which climbs upon, bears down, and thereby destroys growing wheat. It is a slender vine, bearing purple blossoms, and round dark gray seeds (about the diameter of grains of wheat,) in a cylindrical black pod, which bursts and scatters its seeds soon after ripening. Like all other plants of the pea and clover tribe the growing of the partridge pea is promoted in a peculiar degree by the use of marl and other calcareous manures—and it may be presumed also by the use of gypsum, where that manure will act on any thing.]

Gloucester, Aug. 1st, 1834.

I am pleased to find that the farmers of Virginia, are becoming sensible of the exceeding grievance which the existing law of enclosures imposes on them. It would be a relief to the farmers of this state nearly equivalent in value to their annual tax, if all were compelled to enclose their own hogs. The burthen would be vastly relieved if we could with any security make our outer fences of post and rail, or any material sufficient to defend us from our neighbor's large stock. As it is, I know no respectable farmer who would not be glad to pasture his poor neighbor's few cows, if he could thereby be secured from general depredation. All timber is becoming very scarce and expensive in the lower part of Gloucester county, and this is a matter to which we must be soon compelled to call the attention of our legislators.

IRON WAGON WHEELS.

We saw a wagon in Court street this forenoon, which, from the novel construction of the wheels, excited considerable curiosity in the passers-by. They were made entirely of iron—the outer part of the wheel was formed from a single piece of iron about an inch and a half square—the spokes were round, and five-eighths of an inch in diameter. The naves were constructed in a new and ingenious manner, by which the friction is much diminished; and the whole appearance of the wheels conveyed the idea of usefulness, neatness, and simplicity.

On inquiry, we learned that these wheels were calculated to sustain a weight of a ton and a half—and that wheels of the ordinary construction, to sustain so great a weight, would weigh about the same as these newly invented wheels. The expense also, we were informed, will not vary materially from those in common use. They were manufactured by Mr. Hale, of South Boston; and we believe this is the first attempt of the kind to manufacture all the parts of the wheel of iron. The advantages to be derived from this invention are neatness, safety, and durability.—*Bost. paper.*

TO CORRESPONDENTS AND SUBSCRIBERS.

We often receive communications of such ambiguous form as not to be sure whether they are designed for publication as they appear, or are private—or even in part confidential. To decide in such cases is incurring more responsibility than is our fair share. We have always endeavored to comply with what we presumed were the correspondent's wishes—but it is not likely that these guesses have been always correctly made. It is desirable that every article intended for publication without alteration, or with no more change of form than the editor may require, should be headed "For the Farmers' Register," or that object expressed in any other manner the writer may prefer. If any passage is intended as private and confidential, let it be marked "private," and the writer's wishes cannot be mistaken, and will be always respected. Every other letter having neither of these characters marked, will be considered as private, but from which we may be permitted as heretofore, to extract for publication any passages that we deem of interest to the public. It is in this manner that our "Extracts of private correspondence," have been obtained—and for their insertion, we only are responsible.

The ambiguity of which we complain causes another doubt as to communications of a mixed character—that is, whether we are authorised to use the writer's proper signature, as he has given it—or should omit it, because the publication may not have been intended. If the former course is taken, and the writer's intention is mistaken, we are liable to be censured for using names without permission—and if the name is omitted, from a mistaken fear of that charge, it may be considered as a want of proper respect for the writer. Our correspondents will see the existing difficulty, and we hope, will relieve us from it in future.

We are always glad to be allowed to publish the proper signature of every one who writes on practical agriculture, or who offers any statements of facts. Nevertheless, no name will ever be so used, intentionally, without the writer's consent: and therefore our correspondents need not fear giving their names to the editor, (which is always desirable, though not insisted on) even when they wish them withheld from the public. The affixing any fictitious signature to a communication, will always be considered as a prohibition of the use of the writer's name.

These requisitions may be thought idle, and the inconveniences complained of as of no account. But the evil to us is not only considerable, but is increasing. Some of our correspondents may already have seen proofs (if indeed we have mistaken their intentions,) of the necessity of some regulation in this matter.

The proposed *Cheap Edition of the Farmers' Register* has received so little support, that the publication is necessarily abandoned. If this result has been a disappointment to our expectation of sending the Farmers' Register to a new and numerous class of readers, it has also decisively proved the general preference for the present form of our publication, and that few would feel compensated by a diminution of price, for the inferior quality and more perishable form of the Cheap Edition as proposed.

The following communications have been received: "On the true principles of profitable husbandry"—"Thoughts on rearing fruit trees"—Remarks on the Woodson and Cunningham Grapes"—Insects and their destroyers"—"On the fence law"—"Colic in horses"—"On water furrowing hill-sides"—"On Lobelia Inflata"—"Account of Emmons' horse power machinery"—"Ashes on farm yard litter"—"Petition for a change in the law respecting inclosures"—"Black peas following wheat"—"Proceedings of an agricultural meeting in King William"—"The prevailing habits and opinions which oppose the prosperity of agriculture."

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SUPPLEMENT

TO No. 4, OF FARMERS' REGISTER.

After the last sheet of No. 4 was ready for the press, we received some of the latest Nos. of our British agricultural periodicals; and being unwilling to withhold their contents entirely from our readers until October, these supplementary pages are added with that view, and also to lessen the accumulation of matter on hand for publication.

[As the want of space will not permit at this time the insertion of all the reports which form the article commenced below, it is proper to state that the results concur in proving that it is unprofitable to fatten cattle on steamed food, instead of similar food in a raw state —and that the steamed food is profitable to be used for hogs, though less so than has been supposed.

The experiments deserve attention not only for the subject, and the results, but also on account of the very particular and accurate manner in which all the processes were conducted, and the full and clear reports exhibited. This is the proper manner in which experiments should be made, and their progress and results noted and reported: and a few such on any one contested point in agriculture, conducted by different persons, and in different modes, will go farther to reach valuable truths, than volumes of mere speculation and opinion, or of arguments founded on such unstable foundations. Nor does the difference of results in different experiments impair their value, provided every circumstance affecting them was observed and reported. In no complicated experiment, of considerable duration, can the farmer foresee or regulate every circumstance necessary to his object: and the omission of observing some one such unsought for and unexpected agent, may make the report false, and the whole experiment worse than worthless. But when all such circumstances are fully and truly stated, they often lead to truths, which though different from, may be as valuable as those that the experimenter was seeking.

The usefulness of the Highland Society of Scotland to agriculture, and to the general prosperity of their country, may be inferred from this small sample of the manner in which their patriotic efforts are directed—and we respectfully recommend the example to the different agricultural societies already formed, or now forming in Virginia. The same general faults, (though in different degrees, have been exhibited by all that have existed, and will be, we fear, by all now coming into existence. They are societies for *talking* instead of *working*—for speech-making upon things in general, instead of for making accurate experiments, and reporting statements of facts, for the improvement of agricultural practice. If the duties required of the members of agricultural societies were merely to make and report experiments in a proper manner, (though certainly there is no reason why their labors should be confined within these limits,) the value of their transactions would be great indeed. By every report, or memorandum, something would be added to the amount of established truths: and by a proper bond of union between all, each society would be benefited not only by the labors of its own members, but as much by those of all others. Let each member be required to *do* something, and the labors of all would be immense, both in quantity and value. But if one hundred societies were now formed, to go through the old round of constitution-making and speech-making, they would do no good, even if they did not produce injury to their cause, as is generally the result of all misdirected efforts. There is nothing we are more anxious to see than the intellect and strength of the agricultural interest of Virginia arrayed in properly constituted agricultural societies: and there is no public measure that we have less faith in, as a means of promoting agricultural improvement, than societies organized and conducted as they generally have been.]

REPORTS ON THE COMPARATIVE ADVANTAGES OF FEEDING LIVESTOCK ON RAW OR ON PREPARED FOOD.

From the Prize Essays and Transactions of the Highland Society of Scotland.

[In 1833, the Society, considering the importance of determining the comparative advantages of feeding live-stock on raw or on prepared food, offered a piece of plate of Thirty Sovereigns value, for the best report, founded on actual experiment, made for that purpose, on a number of oxen or heifers, not fewer than six, the animals to be of the same breed, age and sex, and the term of feeding not less than three months. At the same time, a premium of Ten Sovereigns was offered for a report on the feeding of ten or more swine of the same age and breed. Five reports were received. The premium for horned cattle was adjudged to Mr. Walker, Ferrygate, Haddington, and that for swine to Mr. Boswell of Balmuto. Extracts of the other reports, to the authors of which the thanks of the Society were voted, are also given.]

Report of an Experiment on the Feeding of Six Heifers and Four Oxen.

By Mr. ROBERT WALKER, Ferrygate, Haddington.

Here, ample barn-yards still are stored
With relics of last autumn's hoard,
And firstlings of this year.

On the 20th day of February 1833, we put up to feed six two-years-old heifers, bred by ourselves, got by a thorough bred short-horned bull, out of common country cows, and as nearly equal as could be selected from a large lot, both in point of weight and feeding qualities. At the same time, we also put up four two-year-old stots, part of a lot purchased at Dalkeith October Fair from Mr. James Haliburton, cattle-dealer, at Hawick.

From the circumstance of both lots having been, some time previous to 20th February, on full keep,—the heifers on common white glope turnips, with an allowance of 3 lbs. of bruised

beans each beast per day, the stots on good purple-topped Swedish turnips, and the same quantity of bruised beans per day,—we were enabled to make a better selection than we could have done from any lot of lean cattle, because they had then fully begun to display their feeding qualities. Both lots previous to 20th February were kept amongst others in the open court-yard with sufficient sheding.

On being put up preparatory to this experiment, the heifers were divided into two lots of three each, as nearly equal as possible, both in point of weight and apparent feeding qualities, and put into an open court-yard wiht sheds, which had peen divided with a railing for the purpose of keeping them separate, and lots were cast to determine which three were to be put on raw, and which three on the steamed food.

The same preparatory process was followed with the stots, equally divided, two and two in each lot,—only with this difference, that the stots were kept entirely under cover of the sheds, but loose, and having abundance of room to walk about, with plenty of light and air.

The heifers were allowed as many purple-topped Swedish turnips topped, rooted, properly cleaned, and cut into pieces, so that they could get them into their mouths, as they could consume, with 3 lbs. of bruised beans, and 20 lbs. of potatoes each beast per day, in addition to the turnips, with half a stone of straw each.

The stots were allowed as many of the same sort of turnips as they could eat, with 4½ lbs. bruised beans, and 30 lbs. of potatoes each beast per day, with half a stone of straw each. That is to say, the food of the stots and heifers was the same only with this difference, that the stots were allowed 1½ lbs. beans and 10 lbs. potatoes more per beast than the heifers, each day.

The mode of preparing the food was steaming, by placing a tub, with holes in the bottom, above a common furnace pot or copper, used for making the harvest porridge. The tub was drawn off and on the top of the pot by a block and tackle, attached to a sort of crane for shifting the tub into the position when wanted. The tub used for preparing the food of the three heifers, was in diameter at top 3 feet 1½ inches, at bottom 2 feet 10½ inches, in depth 1 foot 8 inches. The tub was filled as full as it would hold in the first place with turnips, which required from five to seven hours to steam; —the potatoes were put in on the top of the turnips, about an hour or three-quarters of an hour before being taken off, when the turnips had fallen so much down or lost bulk sufficient to admit them,—the beans were put in last, from twenty to thirty minutes before being taken off,—and all three when taken off were thrown into other tubs with a shovel, and well mixed.

The food for the stots was prepared exactly in the same manner but in a separated tub, at an adjoining farm. The size of this tub was less than the other, being in diameter at top 2 feet 7½ inches, at bottom 2 feet 4 inches, and in depth 1 foot 7½ inches. The food in both cases was given to the cattle in wooden stalls or troughs, always properly cleaned once each day.

Both lots, the cattle on steamed as well as raw food, were fed three times per day,—at day-break, at noon, and lastly an hour before sunset.

The bruised beans were given to the lots on raw food at noon, the potatoes one-half in the morning and the other half at noon.

In both cases, the greatest attention was paid to give both those on raw and those on steamed food as much as they could eat, but no more, so that their food might be as nearly as possible eaten up at the times of refeeding, this being, in the opinion of the reporter, always a prime consideration in every case of feeding, so that the stalls may be always kept clean, and regularly cleared of the refuse.

A table is annexed of the live-weight of the cattle at the beginning of the experiment, the weight at the expiry of every month, and the progressive monthly improvement, with the total improvement in weight during three months; and lastly, their live-weight, when sent away to be slaughtered,—with a comparative statement of their live and dead weights.

The apparatus for weighing the cattle is simply a common steelyard, such as is used at the toll-bars in the county of Edinburgh for weighing carts. The cattle stand on a flat board, which is covered with a little chaff or straw, to prevent the treading of their feet making a noise to frighten them—the board being laid upon blocks of wood, which are put into the frames where the cart-wheels stand, in weighing carts, and elevated just sufficiently high to make the board swim clear of the frame-work of the steelyard. The cattle walk on to the board, which is surrounded on three sides with hurdles or gates, to keep them steady on it during the time they are weighing, the servants standing behind at the open end where the cattle enter. With this very simple apparatus, one might engage to weigh ten cattle in as many minutes—the cattle in general going as easily off and on the steelyard as moving a little backwards and forwards on plain ground.

We very soon discovered that the cattle on the steamed food consumed considerably more turnips than those on the raw food, having laid down for the three heifers on raw food two cart-loads, containing together 25 cwt. 1 qr. 14 lbs. of turnips, and at the same time the like quantity for the three heifers on steamed food; but at the end of four days, very few turnips were left to put into the steam-tub, while apparently little more than the half of those laid down for the raw food was consumed. We then added another load of 12 cwt. 2 qrs. of turnips to the steam, and at the end of seven days, the three heifers on the raw-food had consumed the quantity laid down for them, while the three on steamed-food had consumed the same quantity, and very nearly the whole of the additional quantity of 12½ cwt., at least all but about a half tub, or 250 lbs. of raw turnips; and in order to be very correct, we proceeded to weigh the steamed turnips which were left unconsumed, when we found they only weighed 195 lbs. This circumstance of the weight being much less than we expected, put us on making a series of experiments, of the difference of the weight when put in raw and after being steamed, the result of which will be afterwards detailed, and also in ascertaining, by a more lengthened experiment, the relative quantities of food consumed by each lot of cattle.

On this first and short experiment during one week of seven days, the three heifers on raw food had consumed, as before stated, 25 cwt. 1 qr. 14

lbs. of Swedish turnips, 3 cwt. 3 qrs. of potatoes, and 63 lbs. of bruised beans, being at the rate of 135 lbs. of turnips, 20 lbs. of potatoes, and 3 lbs. of bruised beans for each beast per day. While the three heifers on steamed food had consumed in the same space of seven days, about 37 cwt. 16 lbs. of turnips, being at the rate of 190 lbs. of turnips, 20 lbs. of potatoes, and 3 lbs. of bruised beans per day for each beast, a difference of 55 lbs. of turnips consumed by each beast on steamed food per day more than what was consumed by those on raw food.

On a pretty lengthened experiment made on the difference of the weight of turnips before and after being steamed, we found the result to be as follows:—Upon turnips which had been taken from the ground in the early part of February, when they were full of juice, weight when raw 5 tons 8 cwt., after being steamed 4 tons 4 cwt. 3 qrs. 16 lbs., being a loss of weight in the process of steaming of 1 ton 3 cwt. 12 lbs., or in round numbers, the turnips may be said to have lost nearly one-fifth of their weight in the process of steaming, and further we may mention, that they also lost about one-fourth or one-fifth of their bulk. But at an after period, when the turnips were lifted from the ground after the middle of April, the loss of weight in the steaming process was not near so great, not being one-sixth of their raw weight in place of one-fifth as formerly stated. The loss of weight on steaming potatoes was a mere nothing, not being more than $\frac{1}{50}$th part. Still, although the cattle at this latter period, viz. the end of April and beginning of May, did not consume quite so much weight of turnips, they consumed fully more bulk. The turnips having lost considerably in weight in proportion to their former bulk, it now requiring a larger cart-load to weigh 16 cwt. than it did in the month of February; this circumstance being easily accounted for, because the tops of the turnips were now vegetating rapidly, and the bulb losing its former sap. But in every case throughout the whole course of the experiment, the difference consumed by the cattle on steamed food above those on raw, was about 55 lbs. of turnips per day for each beast.

As formerly stated, the stots were allowed, in addition to the turnips, 30 lbs. of potatoes each, and 4½ lbs. of bruised beans, being 10 lbs. of potatoes and 1½ lbs. of beans each beast more than the heifers per day. In this case, the result was exactly similar to that of the heifers, the stots on the steamed food consuming about 55 lbs. per day of turnips more than those on the raw food each beast.

The steamed food being 94 cwt. 14 lbs. of turnips for twenty-eight days of two cattle, about 195 lbs. per day, and the raw food being 70 cwt. for the same time, about 140 lbs. per day. The twenty-eight days alluded to were the last twenty-eight days of the experiment, from the 22d of April till the 20th May.

We may now be permitted to state, that our experiment might very easily have shown different results; that the cattle on steamed food might have been shown to have consumed less instead of more food, and as a necessary consequence, a great shortcoming in the article of improvement, because in the very outset of our experiment, we discovered that it was necessary that the steamed food should be always fresh, or in other words, newly done, and if it was old done, cold and sour, the cattle would hardly eat it unless when very hungry; in short, the quantity they would consume might have been made to agree to the fresh or sour state of the food when presented to them. If warm and newly done, they would eat up their feed with avidity, if cold and sour, they would not taste it, unless compelled by hunger. We therefore resolved to give them their food always as newly prepared as possible, thinking that the first object of our experiment was to fatten both lots of cattle as well as we could, and afterwards to calculate the expense. We are quite aware, that to have done a large quantity at one steaming, would have lessened the expense both of coal and labor, and also, by getting sour before being used, saved a vast quantity of food. But we are equally well aware, that by so doing we never could have fattened our cattle on steamed food. And on the other hand, had we restricted our different lots of cattle to the same weight of food, those on steamed food would not have had as much as they could consume, provided the steamed food was properly administered; and therefore, by a parity of reasoning, the cattle on the steamed food could not make the same improvement as they would have done on full keep. Our object has therefore been, as formerly stated, to fatten both lots of cattle, and afterwards calculate the different expense.

A small quantity of salt was allowed the cattle as a sort of condiment amongst their food. Those on steamed food had it amongst their food when being taken from off the steam; those on raw food had it mixed with the bean-meal, at the rate of about $\frac{1}{8}$th of a lb. each beast per day. They did not get any salt for the first ten days, but after being used to it for three weeks, we tried the cattle on steamed food with one feed without salt. They did not seem to relish it so well: we then put a little salt on their food in the stall, and they at once began to eat greedily; both those on steamed and those on raw food were evidently fond of the salt. We used the salt at the first, in order to prevent the steamed food from getting so soon sour, which had a very decided effect in this respect. In our calculations of the value of keep, we have not stated any thing for straw consumed by the cattle, as they were frequently supplied with litter of the same sort of straw, not deeming the straw of any other use than being made into dung.

TABLE I.

Live weight of Cattle, with monthly increase, and total increase of weight in three months; and also Live weight when sent away to be killed, with Dead weight of Beef, Tallow, Hides, &c.

	1	2	3	4	5	6	7	8	9	10	11	12	13
	Live weight 20th Feb.	Live weight 20th March.	Increase 1st month.	Live weight 20th April.	Increase 2nd month.	Live weight 20th May.	Increase 3d month.	Total increase for 3 months.	Live wt. when sent away to be killed.	Dead weight Beef.	Weight of Tallow.	Weight of Hides.	Weight of Offals.
HEIFERS.													
Steam food,	st.	st.	st.	st.	st.	st.	st.	st.	st.	st. lb.	st. lb.	st. lb.	st. lb.
No. 1.	76*	83	7	87	4	92	5	16	90	51 12	8 4	3 12	25 13½
No. 2.	78	84	6	90	6	95½	5½	17½	94	54 0	8 4	4 3½	27 7
No. 3.	68	74	6	79½	5½	83	3½	15	83	46 2	6 10	3 8	26 8
	222	241	19	256½	15½	270½	14	48½	267	152 0	23 4	11 9½	80 0½
Raw food,													
No. 4.	84	89	5	95	6	98	3	14	98	55 8	8 7	4 3	29 10
No. 5.	68½	76	7½	81	5	86	5	17½	86	48 4	6 12	3 7½	27 4½
No. 6.	70	76	6	81	5	84	3	14	84	46 5	9 6	5 1½	23 1½
	222½	241	18½	257	16	268	11	45	268	150 3	24 11	12 12	80 2
STOTS.													
Steam food,													
No. 7.	84	90½	6½	99	8½	103	4	19	99½	56 10	8 11	5 12	28 3
No. 8.	92	98	6	103	5	106	3	14					
	176	188½	12½	202	13½	209	7	33	99½	56 10	8 11	5 12	28 3
Raw food,													
No. 9.	90	96	6	100	4	105	5	15	102½	58 6	8 8	5 4	30 4
No. 10.	84½	92½	8	100	7½	108	8	23½					
	174½	188½	14	200	11½	213	13	38½	102½	58 6	8 8	5 4	30 4

Explanation of the above Table.—Column 1. contains the live-weight of the cattle when put up to fatten on the 20th of February. Column 2. the live-weight on the 20th of March. Column 3. the increase of the cattle for first month, viz. from the 20th February till 20th of March. Column 4. live-weight on the 20th of April. Column 5. increase the second month. Column 6. live-weight on the 20th of May. Column 7. increase the third month. Column 8. Total increase for three months. Column 9. live-weight when sent away to be killed; the heifers on the 25th of May, and the stots on the 10th June. Column 10. dead weight of beef. Column 11. weight of tallow. Column 12. weight of hides. And, column 13., offals, or weight wanting over beef, tallow, and hides, to make up the live-weight when last weighed.

TABLE II.

Cost of the Keep of Cattle for One Week.

	Cwt.	qrs.	lbs.	price per cwt.	Amount.
Three heifers, on steamed food,					
consumed of Swedish turnips,	37	0	16	£0 0 4	£0 12 4¾
of potatoes,	3	3	0	0 1 3	0 4 8
of beans, 1 bushel,	0	2	7		0 3 0
of salt,					0 0 0¾
Estimate for coal and extra labor					0 2 0
Cost of one week of three heifers, or 7s. 4½d. each per week,					£1 2 1½

	Cwt.	qrs.	lbs.	price per cwt.	Amount.	
Three heifers, on raw food,						
consumed of Swedish turnips,	25	1	14	£0 0 4	£0 8 6¼	
of potatoes,	0	3	3	0 1 3	0 4 8	
of beans, 1 bushel,	0	2	7		0 3 0	
of salt,					0 0 0¾	
Cost of one week of three heifers, or 5s. 5d. each per week,					0 16 3	0 16 3
Additional cost per week on three heifers on steamed food,						£0 5 10½

* The *stone* 14 lbs. avoirdupois, is the weight marked in this table.

TABLE III.

	Cwt.	qrs.	lbs.	price per cwt.	Amount.
Two stots, on steam,					
consumed of Swedish turnips,	23	2	0	£0 0 4	£0 7 10
of potatoes,	3	3	0	0 1 3	0 4 8
of beans, 1 bushel,	0	2	7		0 3 0
Estimate for coal and extra labor,					0 1 6
for salt,					0 0 0½
Cost of one week for two stots, or 8s. 6¼d. each per week,					£0 17 0½

	Cwt.	qrs.	lbs.	price per cwt.	Amount.		
Two stots, on raw food,							
consumed of Swedish turnips,	17	2	0	£0 0 4	£0 5 10		
of potatoes,	3	3	0	0 1 3	0 4 8		
of beans, 1 bushel,	0	2	7		0 3 0		
of salt,					0 0 0½		
Cost of one week of two stots, or 6s. 9¼d. each per week,					£0 13 6½	0 13 6½	
Additional cost per week on two stots on steamed food,						£0 3 6	

Cost of 3 heifers on steam food, from the 20th of February till the 20th of May, 12 weeks 5 days, at £1 2 1½ per week, as per Table II, £14 1 3½

Cost of 3 heifers on raw food, from the 20th of February till the 20th of May, 12 weeks 5 days, at 16s. 3d. per week, as per Table II, 10 6 7¼

Total additional cost of 3 heifers on steam food above those on raw food, £3 14 8¼

Estimate of Profit and Loss.

Value of 3 heifers on steam food at 20th February:					
Live-weight as per Col. 1. Table 1. 222 stones, divided by 1.75, as a factor, gives 126 stones 12 lbs. of beef, at 5s. 6d. per stone, sinking the offal,	£34	17	8½		
Add cost of keep as above,	14	1	3½		
Total cost,	£48	19	0	£48	19 0
Value when killed, 152 stones of beef, as per Table I. Col. 10 at 6s. 6d. per stone, sinking the offal,				49	8 0
Profit on the cattle on steam food,				£0	9 0

Value of 3 heifers on raw food at 20th of February:					
Live-weight as per Col. I. Table I. 222½ stones weight, divided by 1.75, as a factor, gives 127 stones 2 lbs. at 5s. 6d. per stone, sinking the offal,	£34	19	3¼		
Add cost of keep as above,	10	6	0¼		
Total cost,	£45	5	10½	£45	5 10½
Value when killed 150 stones 3 lbs. of beef, at 6s. 6d. per stone, as per Col. 10. Table I. sinking the offal,				48	16 4½
Profit on the cattle on raw food,				£3	10 6

Cost of two stots on steamed food from the 20th of February till the 20th of May, 12 weeks 5 days, at 17s. 0½d. per week, as per Table III, £10 16 8

Cost of two stots on raw food from the 20th of February till the 20th of May, 12 weeks 5 days, at 13s. 6½d. per week, as per Table III, 8 12 2

Total additional cost of two stots on steamed food above those on raw food, £2 4 6

Estimate of Profit and Loss.

Value of stot No. 7. Table I. at 20th of February:					
Live-weight 84 stones, divided by 1.75, as a factor, gives 48 stones of beef at 5s. 6d. per stone, sinking the offal,	£13	4	0		
Cost of keep as above,	5	8	4		
Total cost,	£18	12	4	£18	12 4
Value when killed 56 stones 10 lbs. of beef, as per Col. I. Table I. at 6s. 6d. per stone, sinking the offal,				18	8 7½
Loss on steam stot,				£0	3 8½

Estimate of Profit and Loss.

Value of stot No. 9. Col. 1. Table I. 20th February:						
Live-weight 90 stones, divided by 1.75, as a factor, gives 51 stones 6 lbs. of beef, at 5s. 6d. per stone, sinking the offal,	£14	2	10¼			
Cost of keep as in Table III,	4	6	1			
Total cost,	£18	8	11¼	£18	8	11¼
Value when killed 58 stones 6 lbs. of beef, as per Table I. Col. 10. at 6s. 6d. per stone, sinking the offal,				18	19	9¼
Profit on stot No. 9. on raw food,				£0	10	10

In the foregoing estimate of value, we have stated the beef in the lean state, at 5s. 6d. per stone at the beginning of the experiment, and 6s. 6d. per stone when killed, which, we trust, will be thought a moderate rate of improvement in the value of the beef when fattened.

From the intimation contained in the foregoing Tables, &c., every person will be able to judge for himself of the comparative cost of keep and improvement.

It will be seen from Table II, that the three heifers on steamed food cost on the article of keep £1 2 1½ per week, while the three on raw food, cost only 16s. 3d., a difference of only 5s. 10½d. per week less expense being on the raw food, being 5½d. more than equal to the expense of keep of another beast on raw food.

And referring to Table I, Cols. 10. and 11, it will there be seen that the three on steamed food had only 1 stone 11 lbs. more beef, while the three on raw food had the advantage in point of tallow, by 1 stone 7 lbs., so nearly equal in this respect that there cannot be said to have been any difference at all; and by referring to the stots in the same manner in the same tables, the advantage will be found to be in favor of the raw food. Therefore, we have no hesitation in saying, that in every respect the advantage is in favor of feeding with raw food. But it is worthy of remark, that the difference in the consumption of food arises on the turnips alone. We would therefore recommend any person wishing to feed cattle on steamed food, to use potatoes, or any other food which would not lose bulk and weight in the steaming process, as there is no question but in doing so they would be brought much nearer to each other in the article of expense of keep. But from the experiment made by us, as will be seen by the foregoing estimate of profit and loss, the profit is greatly in favor of feeding with raw food. Upon the whole, we freely give it as our opinion, that steaming food for cattle will never be attended with beneficial result under any circumstances whatever, because it requires a more watchful and vigilant superintendance during the whole process than can ever be delegated to the common run of servants, to bring the cattle on steamed food even upon a footing of equality, far less a superiority, to those fed on raw food.

The only thing which it remains for us to state is, the periods when the cattle were killed, and how they were fed from the 20th May until sent off. The heifers were turned out to a very fine field of grass, of the first season, on the 22d May, where they remained three days, and were then sent away to be slaughtered. They were exhibited at a local Agricultural Show on the 25th May on their road, when the judges thought them fit cattle for the experiment; but none of the gentlemen present were able to distinguish which lot had been fed on steamed food, or which on raw: they were killed on the 28th of May.

Only two of the stots were killed, that was No. 7. of the steamed food, and No. 9. of the raw food; the other two, No. 8. and No. 10. were kept on. A statement of their after management and improvement will now be given. The whole four stots were turned out to the foresaid young grass-field on the 25th May, after the heifers went away, the two which were killed on the 12th, and weighed, as per col. 9, Table I, on the morning before being sent away. The other two which were kept on, were not weighed until the 20th of the month, being the usual day from last weighing.

They remained in the grass-field, which was good land and very fine pasture, until the 12th of August, when they were brought into the court-yard, and were fed on second crop cut clover-grass, what they could eat, with the old allowance of 4½ lbs. of bruised beans per day each.

On the 4th October current, they began to get, in addition to the cut grass and beans, a few common white globe turnips.

The following Table will exhibit their live-weight, with the improvement or loss of weight at the end of every month.

Table of Live-Weight of two Stots kept on.

		No. 10. on raw food.	No. 8. on steamed food.	In-crease.	Loss.
	Live-weight, when weighed on 20th May, as per Table I. Col. 6.				
May 20.	No. 8. or former, on steamed food, - -		106		
"	No. 10. " on raw food, - - -	108			
June 20.	No. 8. " on steamed food, - -		105		1
"	No. 10. " on raw food - - -	109		1	
July 20.	No. 8. " on steamed food, - -		103		2
"	No. 10. " on raw food, - - -	106			3
Aug. 20.	No. 8. after being 8 days in the court-yard on cut grass, - - - - -		108	5	
"	No. 10. do. do. do. do.	108		2	
Sept. 20.	No. 8. do. do. do. do.		113	5	
"	No. 10. do. do. do. do.	111		3	
Oct. 18.	No. 8. after getting a few turnips since 4th curt. - - - -		118	5	
"	No. 10. do. do. do. do.	120		9	

It would therefore appear that the cattle fell off during the time they were out at grass, although, as formerly stated, the pasture was exceedingly fine. We have often before thought that cattle which had been highly kept during winter, made no improvement on grass, but never before had an opportunity of trying their live-weight. From this trial it would further appear, that the stot which was formerly fed on steamed food, has done quite as well since being again put on raw food, as the one which was formerly fed on raw food, as they at this day bear the same relative proportion in their live-weight, which they did on the 20th of May, namely, the raw is still 2 stones in advance, having both increased 12 stones since the 20th of May.

We have not yet determined how long we will keep the two stots, but intend noticing their respective improvement so long as they are kept.

EXPERIMENT ON THE COMPARATIVE ADVANTAGES OF FEEDING HOGS ON RAW OR ON PREPARED FOOD.

By MR. W. DUDGEON, Sypelaw, near Kelso.

From the Prize Essays and Transactions of the Highland Society of Scotland—published in the last No. of the (British) Journal of Agriculture—for June, 1834.

The reporter having, for the last three years, paid a good deal of attention to the rearing and feeding of swine, has some satisfaction in reporting the result of his experiments. It being rather difficult to select the animals all of the exact age and the same sex, the reporter considered it of greater consequence to have the ten shots of the *same kind*, considering the sex to be less material. He was fortunate in getting nine of them of one litter when nine weeks old, and had other three of the same description from another sow. He accordingly proceeded to put up two lots in separate crews, or sow-houses, say six *he* pigs in one place, and five *she* ones in the other; having had them all successfully cut, and with every appearance of doing well. At the same time, the reporter placed other three pigs in a different allotment.

In the mean time, the reporter, on the 2d of July, began to feed the two first lots, giving boiled potatoes to the one description, being lot No. 1. (males,) and to the other, No. 2. (females,) raw potatoes; both lots continued to eat this food with great avidity, getting, at the same time, a little cut grass. About a fortnight afterwards, the reporter changed the food to beans—raw and boiled, of course, to the separate lots. Lot No. 1. got boiled beans, which they ate pretty well; and the other lot got raw beans ground, mixed with water, and salt being applied with both the raw and boiled beans; but the lot No. 2. were very shy in eating their food for some time, and seemed to prefer the cut grass: they, in consequence, did not keep pace with lot No. 1., as they took to the boiled food more readily. However, in the course of eight days, lot No. 2. seemed to take more with the hashed beans, and devoured them greedily, which caused a sort of eruption to come out upon their ears, showing that the food was rather heating for them. The reporter, in consequence, caused a proportion of potatoes to be given with the beans, and added a little more salt, always, of course, observing to give No. 1. the boiled food, and No. 2. the raw. That this mixture had the effect of allaying the irritability and itchiness on their ears and skin, was very soon observable by their taking on fat, and appearing altogether more healthy. The reporter was particularly well situated for ventilating the sow-houses, where they got plenty of room to move about, and had a separate place for feeding and exercise, as well as a place for them to repose in, after receiving their several quantums. These circumstances he considers of consequence in the feeding of these animals, for when kept dry, clean, and airy, they thrive and feed well on comparatively little food, as will be shown by their respective weights, taken at different times, in the annexed table.

Respecting the three pigs, which shall be de-

signated lot No. 3, the reporter was anxious to ascertain the respective merits of the sexes in *feeding*, and he put up two males and one female in this crew, which he caused to be fed on raw and boiled food *indiscriminately*, as it happened to be left over, after serving the other two lots of shots. Two of the pigs of this last mentioned lot were of a very peculiar breed, being a cross of the wild boar and the common sow; they were marked exactly like a zebra, but did not take on fat so readily as the other pigs; hence they were not so profitable, but their bacon had a peculiarly rich and delicate flavor. The reporter had all the three lots of pigs repeatedly washed with soap and water, and he thinks it refreshed them greatly, and caused them to relish their food.

The reporter every eight or ten days, say from the 2d of July till the 2d of October, made repeated observations on the appearance of all the animals; and he may now state generally, that lot No. 1. (males,) fed exclusively upon boiled meat, did thrive throughout in a superior manner to the others, and even to those who had an occasional mixture of raw and boiled meat: thus showing that boiled meat is at all times more nutritive than the raw. The reporter thinks that in all cases of feeding swine, they should be fed on prepared food, adding always a sufficient portion of salt, which seems a necessary condiment in most descriptions of prepared food.

Original expense of the purchasing and feeding the Swine.

To paid for 10 pigs at 25s. each,		£12 10 0
To amount of expense for feeding Lot, No. I.	£8 2 0	
ditto, of ditto, No. II.	6 9 0	
		14 11 0
Amount,		£27 1 0

Items of expense of food for Lot, No. I.

To 4 bolls of beans at 21s.	£4 4 0	
expense of hashing ditto,	0 8 0	
fuel and salt,	0 10 0	
30 bushels of old potatoes, at 8d. per bushel,	1 0 0	
40 ditto of new ditto at 1s. ditto,	2 0 0	
	£8 2 0	

Ditto of food for Lot, No. II.

To 4 bolls of beans at 21s.	£4 4 0	
30 bushels of old potatoes at 8d.	1 0 0	
25 ditto of new ditto at 1s.	1 5 0	
	6 9 0	
Amount of expense for food,		£14 11 0

Price at which the pigs sold for.

To Lot, No. I. at 45s. each,	£11 5 0	
Lot, No. II. at 29s. each,	7 5 0	
	£18 10 0	

Abstract.

To amount of the price and expenses of feeding the swine as per preceding page,	£27 1 0
Amount received, being the price of the pigs sold,	18 10 0
Loss in feeding the swine,	£8 11 0

Table of weights of the Swine.

1833. *I. He Pigs.*

	Weights. st. lbs. oz.	Increase of Weights. st. lbs. oz.
July 2. Weight taken as of this date,	17 2 0	
Aug. 19. Ditto taken as of this date,	27 2 8	10 0 8
Oct. 12. Ditto taken as of this date,	55 8 4	28 5 12
Total increase of *he* pigs since 2d July to 12th October,		38 6 4

II. She Pigs.

July 2. Weight taken as of this date,	14 1 0	
Aug. 19. Ditto taken as of this date,	17 5 8	3 4 8
Oct. 12. Ditto taken as of this date,	31 12 8	14 7 0
Total increase on *she* pigs from 2d July till 12th October,		17 11 8

Abstract.

Increase on *he pigs* from 2d July, until the 12th October,	38 6 4
Ditto on *she pigs* from 2d July till 12th October,	17 11 8
Total increase,	56 3 12

By these tables and statements, the reporter shows a loss of £8 11s. on feeding of the said swine, but which could not have taken place had the pigs been bought at a reasonable price at the time, the reporter having paid 8s. or 10s. more than they were really worth, on account of the recommendation of the breed, and being anxious to furnish the Society with a report; the result of which satisfies him, that the prepared food is the best to be given this description of animals; and, besides, the meat is considered to be superior to those fed on raw food. It will be observed, that lot No. 2 did not at all keep pace, or bear a proper comparison, with lot No. 1; although they did not consume the same quantity of food (and hence were not so extravagant in feeding,) still the reporter thinks they ate an additional quantity of grass, this being given to both lots. Respecting lot No. 3, which got a mixture of food both prepared and raw, they approached nearer to No. 1, in respect to their feeding properties, but they appeared occasionally shy at having their meat so mixed. The reporter was therefore convinced, that it is better, in general, to continue for some time only one description of food, as, whatever the animals become accustomed to, they begin to relish and thrive accordingly.

TO CORRESPONDENTS.

In addition to the communications before stated to have been received, we have to acknowledge the following: "Review of Dr. Spofford's Address to the Agricultural Society of Essex, Massachusetts"—"On gama grass"—"On buckwheat and millet."